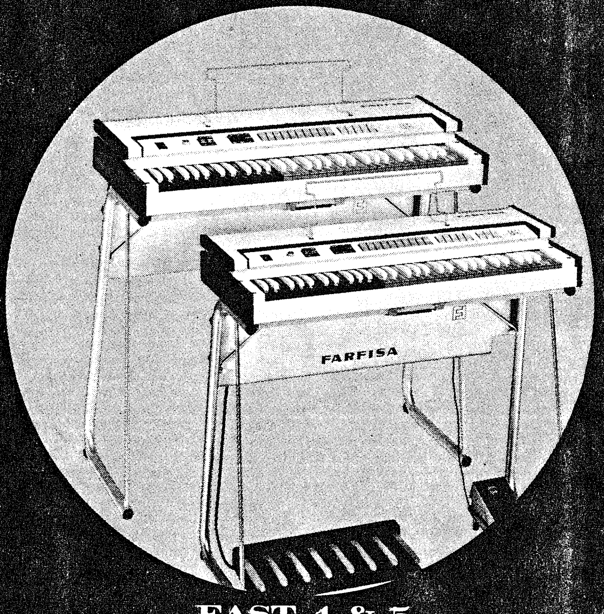
FARFISA
PORTABLE
ORGANS

SERVICE MANUAL

PROFESSIONAL

FAST 2

FAST 3



FAST 4 & 5

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FAST 2

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SPECIFICATIONS

MAIN FEATURES

Keyboard 48 Notes—F to E.
Manual Bass 12 Notes—F to E.

4 Voice Stops (violet tabs):
Clarinet—Flute—Reed—Strings.

Vibrato Stops (blue tabs):
Vibrato On/Off—Slow/Fast.

Overall Volume Control.
Manual Bass Volume Control.

Built-in 10 Watt solid-state amplifier.
Outlet for external additional amplifier.

2 Elliptical Loudspeakers.

Mains Switch and Pilot-light.

Mains Voltage: 117 V

Dimensions: 31″ x 14½″ x 35½″

Weight: 44 lbs.

4 Removable Legs and Retractable carrying handle.

Metal cabinet covered with washable plastic.

Swell Pedal (optional).

ADJUSTMENTS
FAST 2

VR1 VIBRATO SPEED

Vibrato speed may be adjusted using a small regular screwdriver. Proper speed is between 6-7 Hertz with the Vibrato speed tabswitch set in the Fast position.

VR4 ORGAN VOLUME

Set to customer preference! Take into consideration that a full setting may overdrive the speakers causing distortion.

VR5 BIAS

This adjustment is carefully set at the factory. Adjustment should not be necessary unless amplifier transistors or their associated components are replaced. To set this adjustment: First, turn on the Flute tabswitch and hold a three note chord. Then position the Bias adjustment at the point of minimum distortion. Try other chords on the keyboard, both high and low, to make sure the adjustment is satisfactory over the entire keyboard range.

L1 TUNING

The 12 Tone Generator Master Oscillator circuits determine the pitch of the entire organ. Adjusting any one of the Master Oscillator tuning adjustments will tune all the notes of that tone generator. Tuning any group of 12 notes automatically tunes the entire organ.

Tuning may be accomplished by using a small non-conductive screwdriver and one of the following methods:

1. Set of 12 Tuning Forks: Zero beat the note of the organ to be tuned to the sound of the corresponding tuning fork. This is a highly accurate tuning method.
2. Strobo Conn or Strobo Tuner: This is done by visual observation of a strob pattern. Simply follow directions supplied with the Strobotuner. This is a highly accurate tuning method.
3. Another instrument: Zero beat the note of the organ to be tuned to the sound of a corresponding note on an "in tune" instrument (piano, organ, accordion, etc.) Accuracy is dependent upon the tuning of the other instruments. This method is especially desirable when the other instrument is to be played with the organ.
4. One Tuning Fork: One tuning fork is used to set the "temperament" (one note). The other 11 notes are set by ear using the number of beats between "4ths" and "5ths." This requires a trained ear. Accuracy is dependent upon the tuner.

TRANSISTOR VOLTAGES

Q No.	Circuit	Collector	Emitter	Base
Q1	Vibrato Oscillator	+5.5*	+2.8	+2.8
Q2	Vibrato Emitter Follower	+12	+5*	+.7*
Q3	Master Oscillator	+2.7	+12	+13
Q4	1st Divider	+6	+1.2	+1.4
Q5	1st Divider	+6	+1.2	+1.4
Q6	2nd Divider	+6	+1.2	+1.4
Q7	2nd Divider	+6	+1.2	+1.4
Q8	Treble Sole Divider	+1.5 or +10	+1.1	+1 or +1.8
Q9	Treble Solo Divider	+1.5 or +10	+1.1	+1 or +1.8
Q10	1st Bass Divider	+1.5 or +10	+1.1	+1 or +1.8
Q11	1st Bass Divider	+1.5 or +10	+1.1	+1 or +1.8
Q12	2nd Bass Divider	+1.5 or +10	+1.1	+1 or +1.8
Q13	2nd Bass Divider	+1.5 or +10	+1.1	+1 or +1.8
Q14	Preamp #1	+2.5	+.1	+.2
Q15	Preamp #2	+4.5	+.7	+.4
Q16	Input Preamp	+.7	+14	+13
Q17	Bias Transistor	+16	+14	+14.5
Q18	Voltage Amp	+14	0	+.7
Q19	Driver #1	+32	+15	+16
Q20	Driver #2	+.6	+15	+14.5
Q21	Output	+32	+15	+15.5
Q22	Output	+15	0	+.6

*Pulse Voltage

IMPORTANT

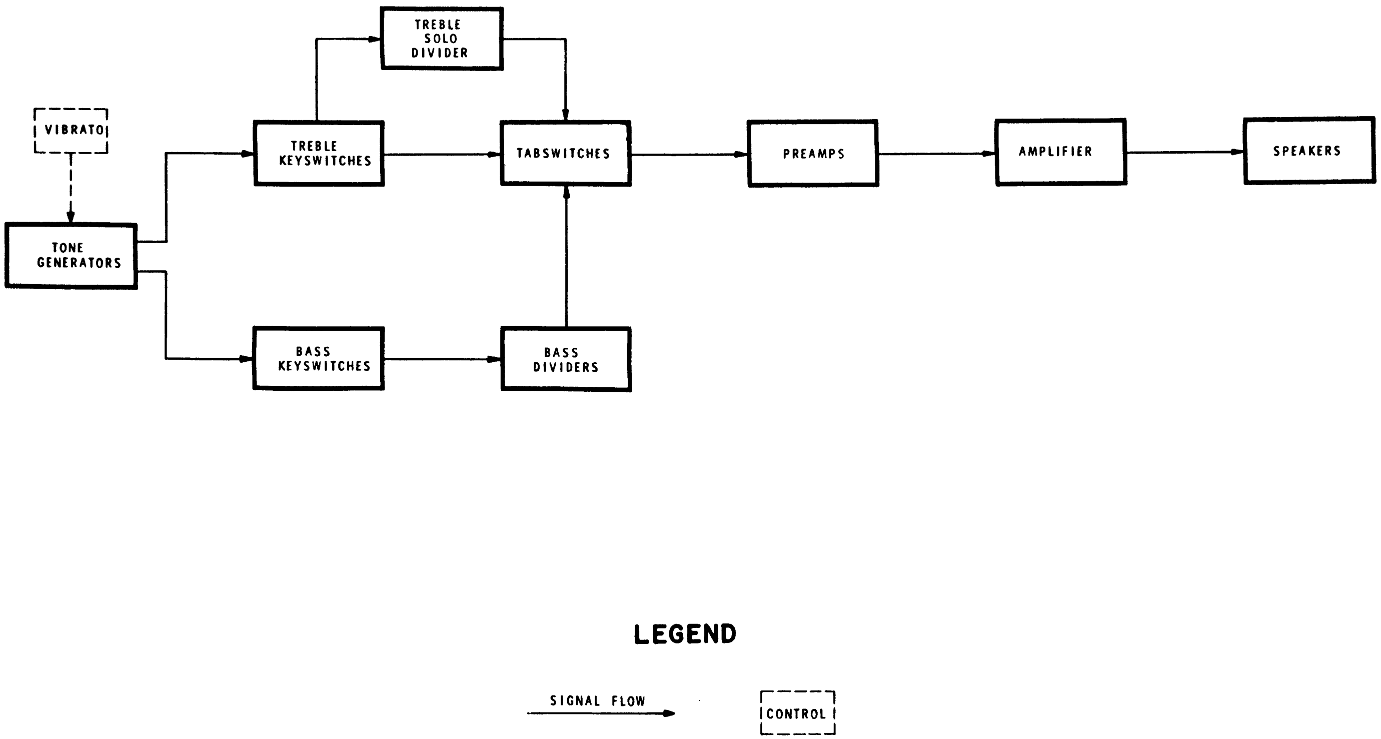
The above voltage readings were measured to ground with a Simpson Model 260 V. O. M. Voltage readings shown are intended only as a guide in troubleshooting. Voltage will vary from organ to organ due to normal manufacturing tolerances.

CAUTION

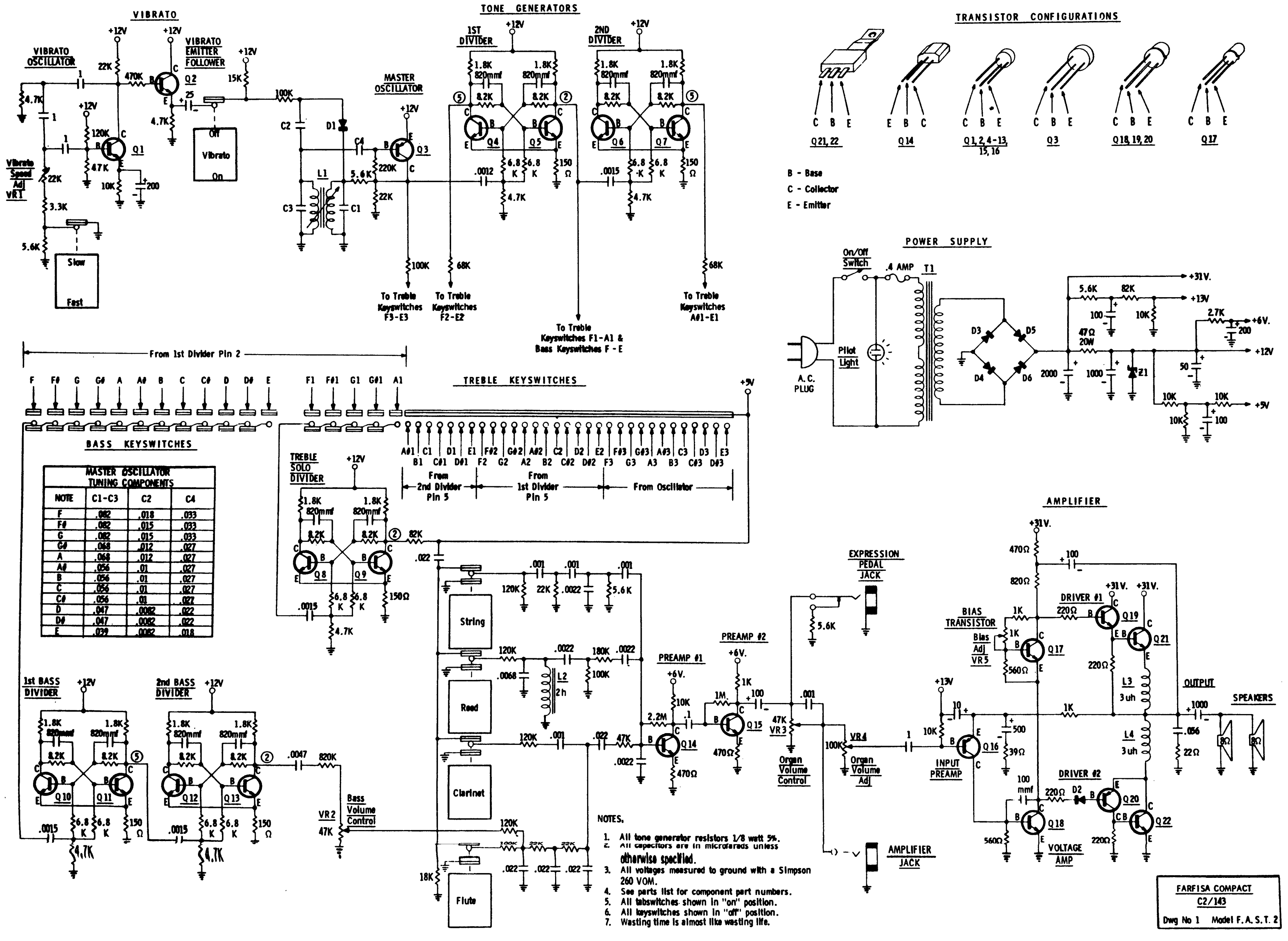
Exercise extreme care when making voltage measurements. Accidental shorting of transistor leads may damage the transistor.

BLOCK DIAGRAM

F.A.S.T. 2


VIBRATO
TONE GENERATORS
TREBLE KEYSWITCHES
TREBLE SOLO DIVIDER
BASS KEYSWITCHES
BASS DIVIDERS
TABSWITCHES
PREAMPS
AMPLIFIER
SPEAKERS
LEGEND
SIGNAL FLOW
CONTROL

FAST 2


VIBRATO
VIBRATO OSCILLATOR
VIBRATO EMITTER FOLLOWER
Vibrato Speed Adj VR1
Slow
Fast
Off
Vibrato
On
MASTER OSCILLATOR
TONE GENERATORS
1ST DIVIDER
2ND DIVIDER
To Treble Keyswitches F3-E3
To Treble Keyswitches F2-E2
To Treble Keyswitches F1-A1 & Bass Keyswitches F - E
To Treble Keyswitches A#1-E1
TRANSISTOR CONFIGURATIONS
Q21, 22
Q14
Q1, 2, 4-13, 15, 16
Q3
Q18, 19, 20
Q17
B - Base
C - Collector
E - Emitter
POWER SUPPLY
On/Off Switch
.4 AMP
T1
Pilot Light
A.C. PLUG
From 1st Divider Pin 2
TREBLE KEYSWITCHES
From 2nd Divider Pin 5
From 1st Divider Pin 5
From Oscillator
BASS KEYSWITCHES
TREBLE SOLO DIVIDER
String
Reed
Clarinet
Flute
1st BASS DIVIDER
2nd BASS DIVIDER
Bass Volume Control
PREAMP #1
PREAMP #2
Organ Volume Control
Organ Volume Adj
EXPRESSION PEDAL JACK
AMPLIFIER JACK
AMPLIFIER
BIAS TRANSISTOR
Bias Adj VR5
DRIVER #1
DRIVER #2
INPUT PREAMP
VOLTAGE AMP
OUTPUT
SPEAKERS

MASTER OSCILLATOR TUNING COMPONENTS

NOTE	C1-C3	C2	C4
F	.082	.018	.033
F#	.082	.015	.033
G	.082	.015	.033
G#	.068	.012	.027
A	.068	.012	.027
A#	.056	.01	.027
B	.056	.01	.027
C	.056	.01	.027
C#	.056	.01	.027
D	.047	.0082	.022
D#	.047	.0082	.022
E	.039	.0082	.018

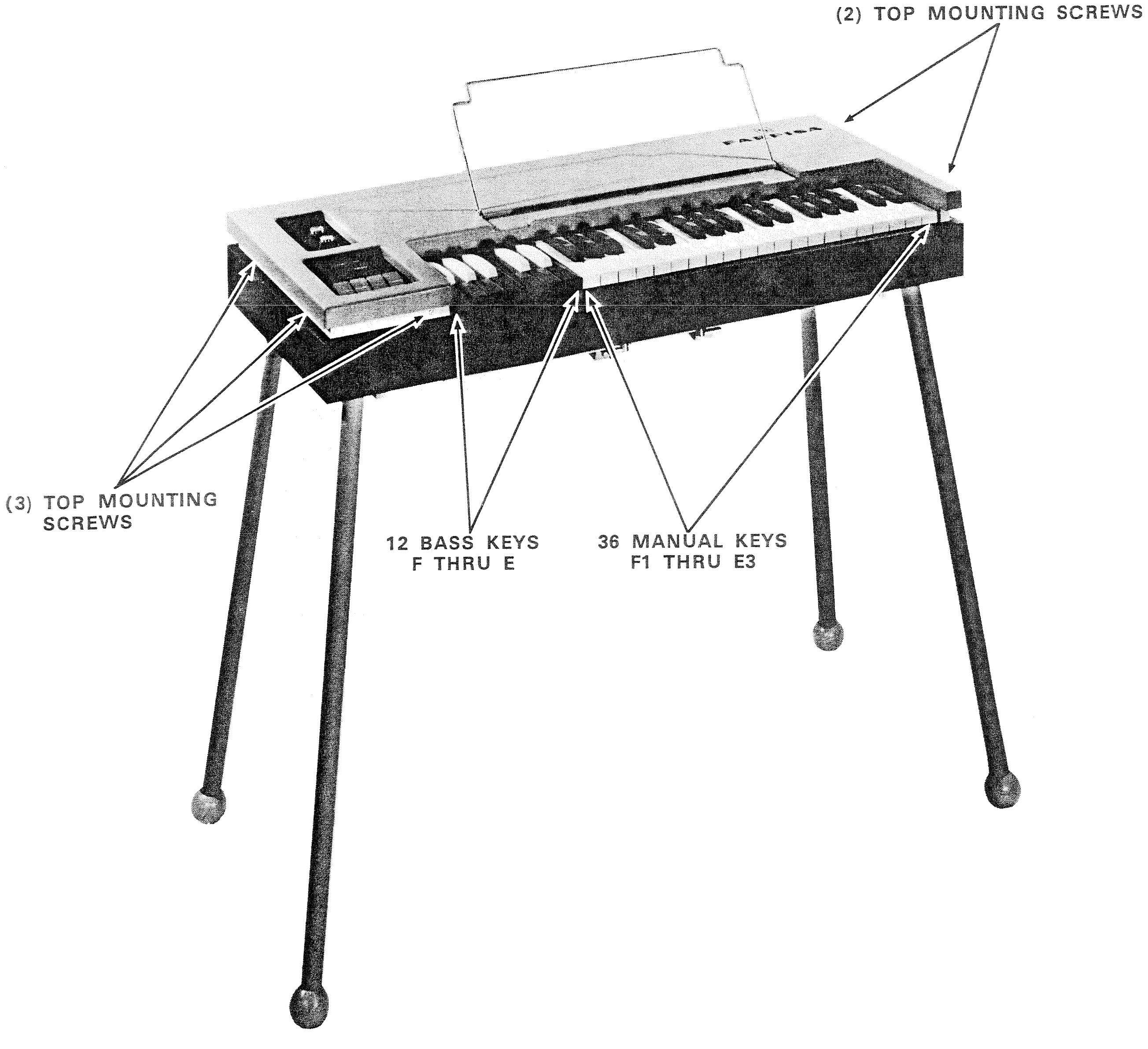
NOTES.

1. All tone generator resistors 1/8 watt 5%.
2. All capacitors are in microfarads unless otherwise specified.
3. All voltages measured to ground with a Simpson 260 VOM.
4. See parts list for component part numbers.
5. All tabswitches shown in "on" position.
6. All keyswitches shown in "off" position.
7. Wasting time is almost like wasting life.

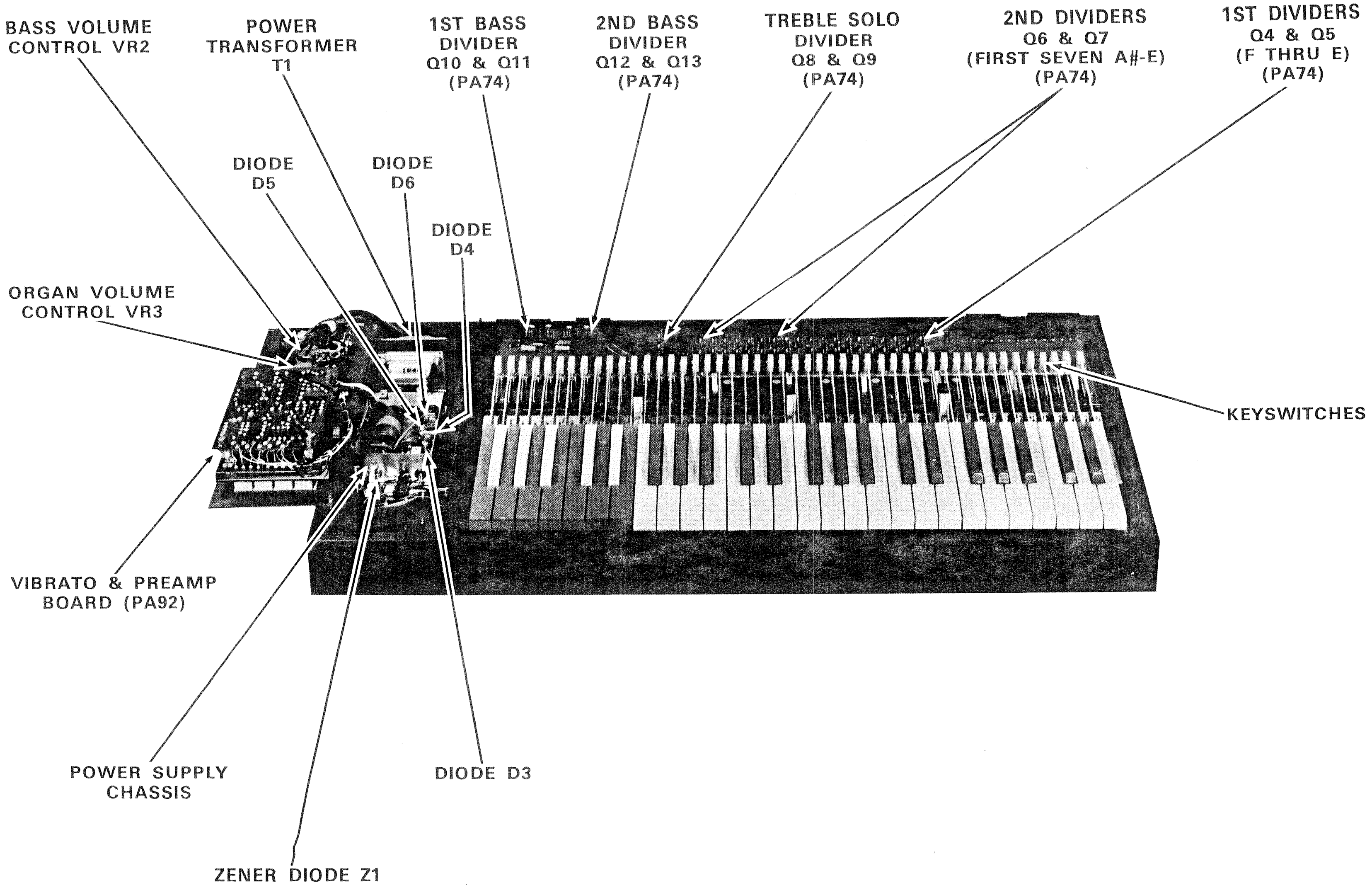
FARFISA COMPACT
C2/143
Dwg No 1 Model F. A. S. T. 2

FAST 2

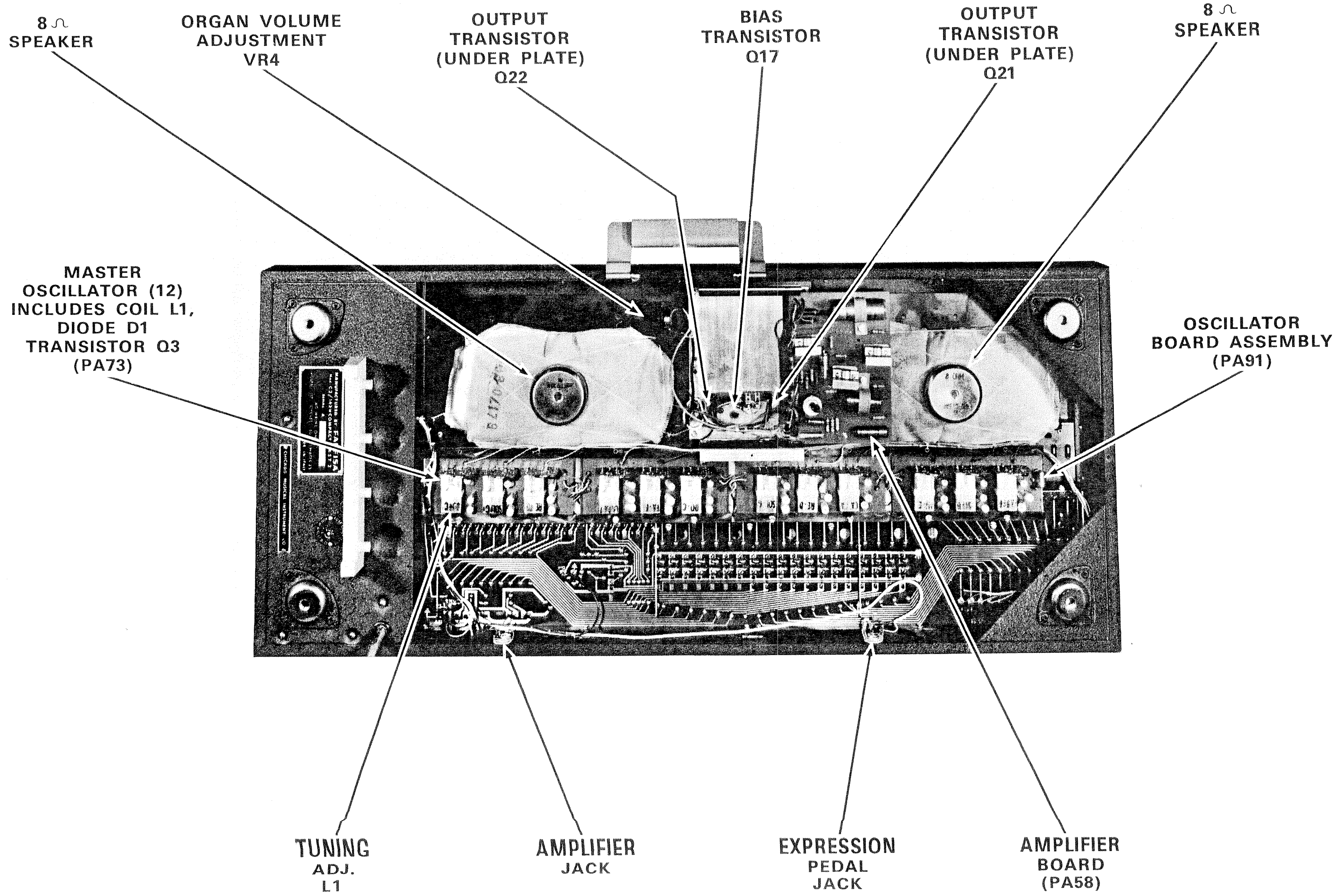
FRONT VIEW
FAST 2


(2) TOP MOUNTING SCREWS
(3) TOP MOUNTING SCREWS
12 BASS KEYS F THRU E
36 MANUAL KEYS F1 THRU E3

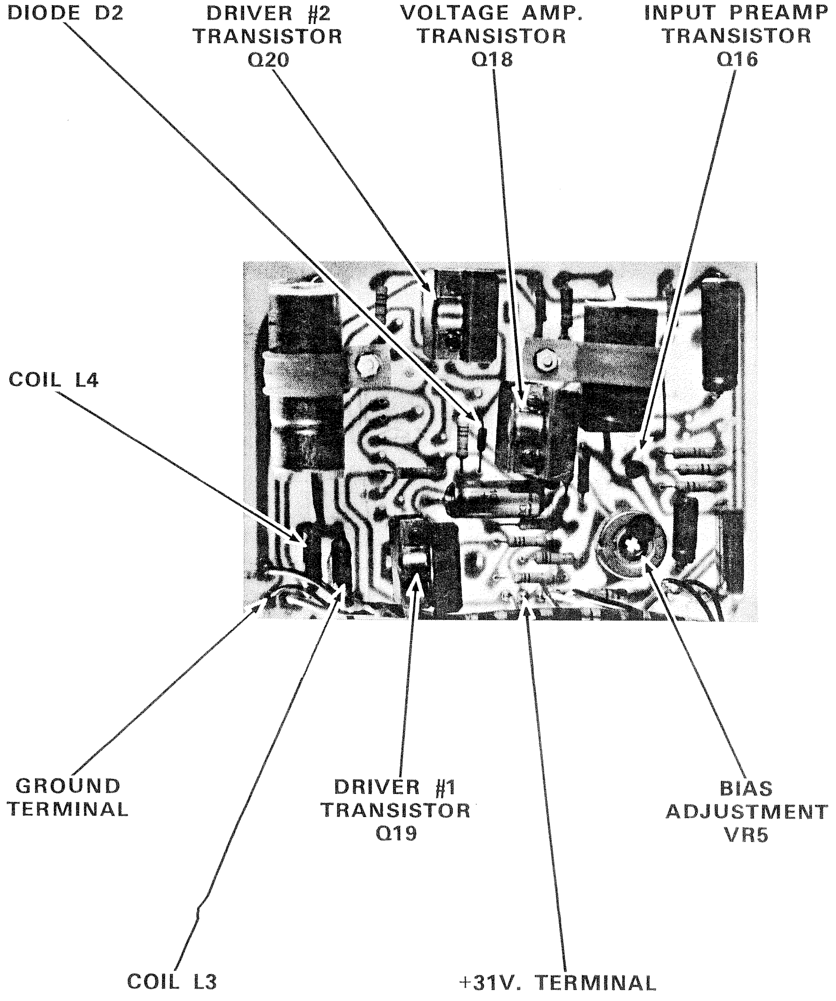
TOP VIEW
(Power Supply Exposed)
FAST 2


BASS VOLUME CONTROL VR2
POWER TRANSFORMER T1
1ST BASS DIVIDER Q10 & Q11 (PA74)
2ND BASS DIVIDER Q12 & Q13 (PA74)
TREBLE SOLO DIVIDER Q8 & Q9 (PA74)
2ND DIVIDERS Q6 & Q7 (FIRST SEVEN A♯-E) (PA74)
1ST DIVIDERS Q4 & Q5 (F THRU E) (PA74)
DIODE D5
DIODE D6
DIODE D4
ORGAN VOLUME CONTROL VR3
KEYSWITCHES
VIBRATO & PREAMP BOARD (PA92)
POWER SUPPLY CHASSIS
DIODE D3
ZENER DIODE Z1

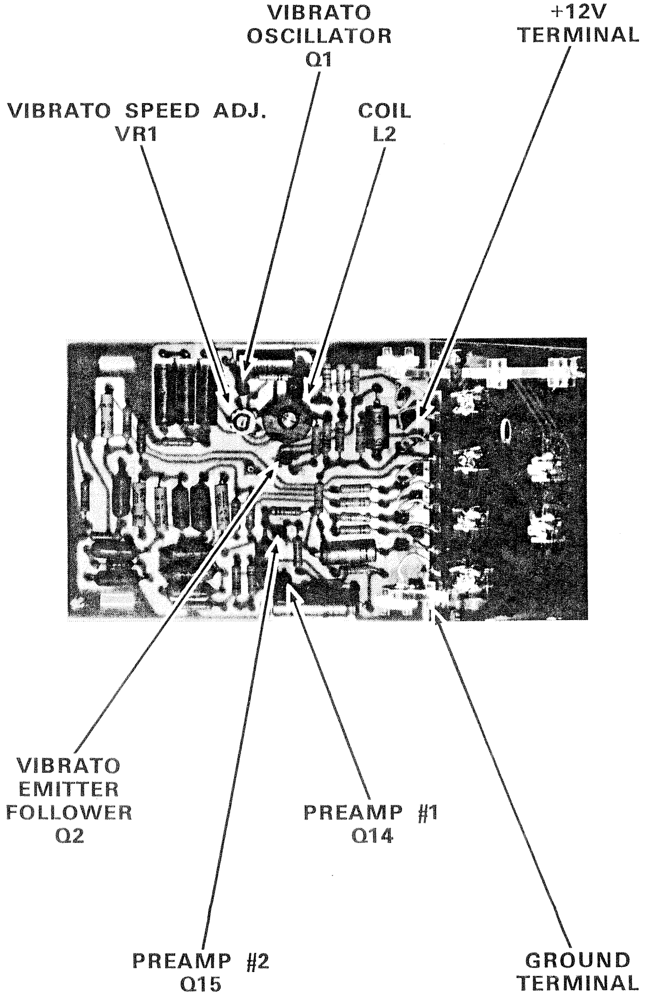
BOTTOM VIEW
FAST 2


8 Ω
SPEAKER
ORGAN VOLUME
ADJUSTMENT
VR4
OUTPUT
TRANSISTOR
(UNDER PLATE)
Q22
BIAS
TRANSISTOR
Q17
OUTPUT
TRANSISTOR
(UNDER PLATE)
Q21
8 Ω
SPEAKER
MASTER
OSCILLATOR (12)
INCLUDES COIL L1,
DIODE D1
TRANSISTOR Q3
(PA73)
OSCILLATOR
BOARD ASSEMBLY
(PA91)
TUNING
ADJ.
L1
AMPLIFIER
JACK
EXPRESSION
PEDAL
JACK
AMPLIFIER
BOARD
(PA58)

AMPLIFIER BOARD
FAST 2
(PA58)


DIODE D2
DRIVER #2 TRANSISTOR Q20
VOLTAGE AMP. TRANSISTOR Q18
INPUT PREAMP TRANSISTOR Q16
COIL L4
GROUND TERMINAL
DRIVER #1 TRANSISTOR Q19
BIAS ADJUSTMENT VR5
COIL L3
+31V. TERMINAL

VIBRATO & PREAMP BOARD
FAST 2
(PA92)


VIBRATO OSCILLATOR Q1
+12V TERMINAL
VIBRATO SPEED ADJ. VR1
COIL L2
VIBRATO EMITTER FOLLOWER Q2
PREAMP #1 Q14
PREAMP #2 Q15
GROUND TERMINAL

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PRINTED CIRCUIT BOARDS

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SPECIFICATIONS

Keyboard: 49 notes C to C
Manual Bass: 12 notes C to B
Overall Volume Control
Optional Swell Pedal

Voice Stops (violet tabs):

Bass	16′
Clarinet	16′
Flute	8′
Oboe	8′
Trumpet	8′
Strings	8′
Flute	4′

Vibrato Stops (blue tabs):
- Vibrato On/Off
- Slow / Fast

Manual Bass Selector tab

Manual Bass Volume Balance Control tab

Mains Switch

Pilot Light

Mains Voltage (for USA and CANADA): 117 Volt AC

Dimensions: 31″ x 17″ x 32.5″

Weight: 44 lbs. — 20 Kg.

Metal cabinet covered with washable vinyl—plastic edges—metal folding legs—retractable carrying handle—removable music rack.

ADJUSTMENTS
FAST 3

VR1 VIBRATO SPEED

Vibrato speed may be adjusted using a small regular screwdriver. Proper speed is between 6-7 Hertz with the Vibrato speed tabswitch set in the Fast position.

VR3 D. C. BALANCE

A slight amount of D. C. voltage is supplied through the D. C. Balance Adj. to the 16′-8′-4′ manual keyswitches. This is done to minimize key click. To adjust the D. C. Balance:

1. Turn on the Flute 4′, Flute 8′ and Bass 16′ Tabswitches.
2. Repeatedly depress several manual keys while turning the D. C. Balance Adj. (Use a small regular screwdriver.)
3. Set Adjustment at point of least amount of D. C. click.

L1 TUNING

The 12 Tone Generator Master Oscillator circuits determine the pitch of the entire organ. Adjusting any one of the Master Oscillator tuning adjustments will tune all the notes of that tone generator. Tuning any group of 12 notes automatically tunes the entire organ.

Tuning may be accomplished by using a small non-conductive screwdriver and one of the following methods:

1. Set of 12 Tuning Forks: Zero beat the note of the organ to be tuned to the sound of the corresponding tuning fork. This is a highly accurate tuning method.

2. Strobo Conn or Strobo Tuner: This is done by visual observation of a strob pattern. Simply follow directions supplied with the Strobotuner. This is a highly accurate tuning method.

3. Another instrument: Zero beat the note of the organ to be tuned to the sound of a corresponding note on an "in tune" instrument (piano, organ, accordion, etc.) Accuracy is dependent upon the tuning of the other instruments. This method is especially desirable when the other instrument is to be played with the organ.

4. One Tuning Fork: One tuning fork is used to set the "temperment" (one note). The other 11 notes are set by ear using the number of beats between "4ths" and "5ths". This requires a trained ear. Accuracy is dependent upon the tuner.

TRANSISTOR VOLTAGES

Q No.	Circuit	Collector	Emitter	Base
Q1	Vib. Oscillator	+5V*	+8.4V	+7.5V
Q2	Vib. Emitter Follower	0V	+2.5V*	+2V*
Q3	Master Oscillator	+1.8V	+7.4V	+7.4V
Q4	Buffer	+3.6V	+8.4V	+8.4V
Q5	1st Divider	+4.4V	+8.4V	+10V
Q6	1st Divider	+4.4V	+8.4V	+10V
Q7	2nd Divider	+4.4V	+8.4V	+10V
Q8	2nd Divider	+4.4V	+8.4V	+10V
Q9	3rd Divider	+4.4V	+8.4V	+10V
Q10	3rd Divider	+4.4V	+8.4V	+10V
Q11	16′ Solo Divider	+4.4V	+7.4V	+7.4V
Q12	16′ Solo Divider	+4.4V	+7.4V	+7.4V
Q13	Preamp #1	+6V	+.2V	+.1V
Q14	Preamp #2	+4.4V	+.2V	+.1V
Q15	Output Preamp	+4.4V	+1.5V	+.2V

*Pulse Voltage

IMPORTANT

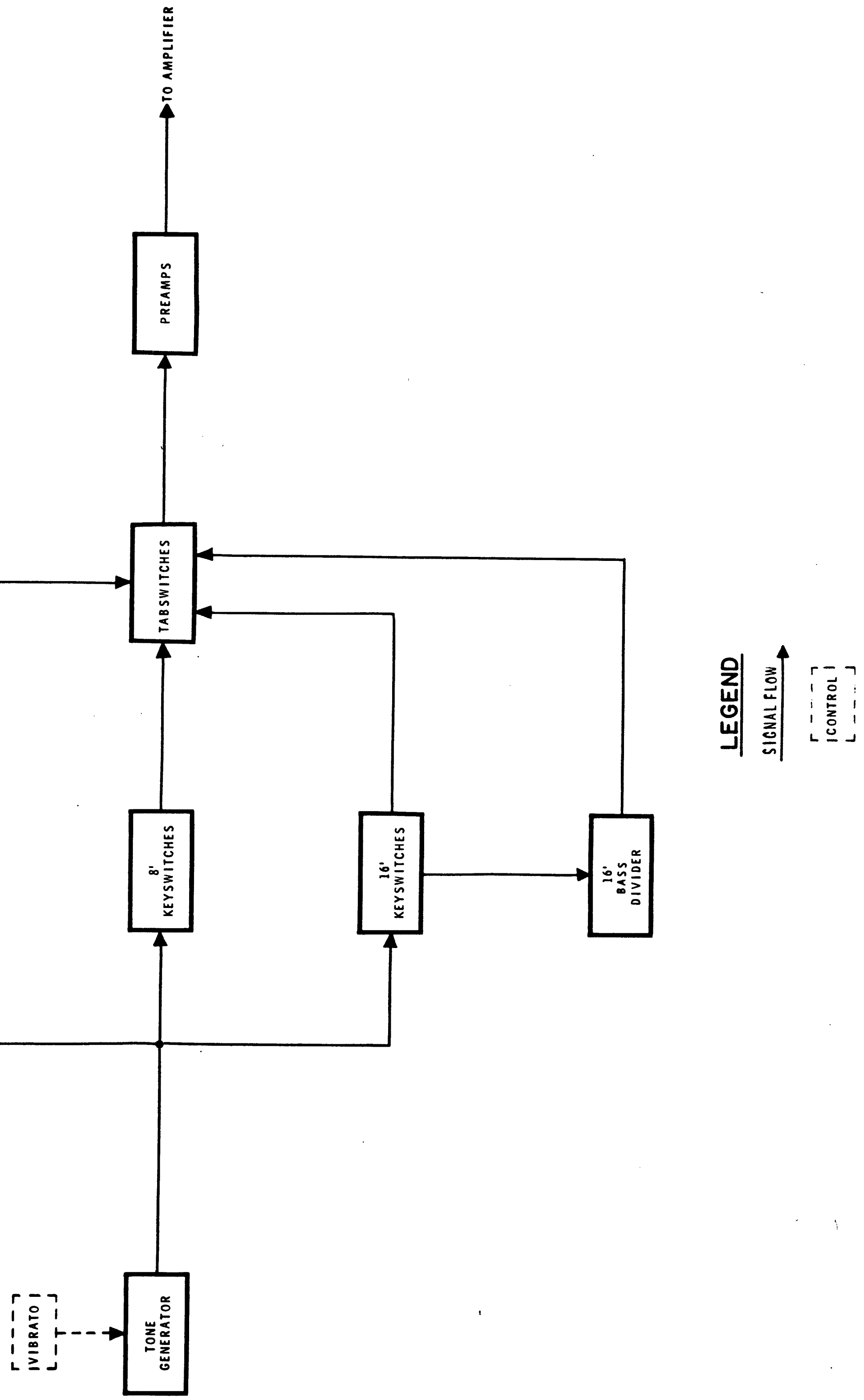
The above voltage readings were measured to ground with a Simpson Model 260 V.O.M. Voltage readings shown are intended only as a guide in troubleshooting. Voltages will vary from organ to organ due to normal manufacturing tolerances.

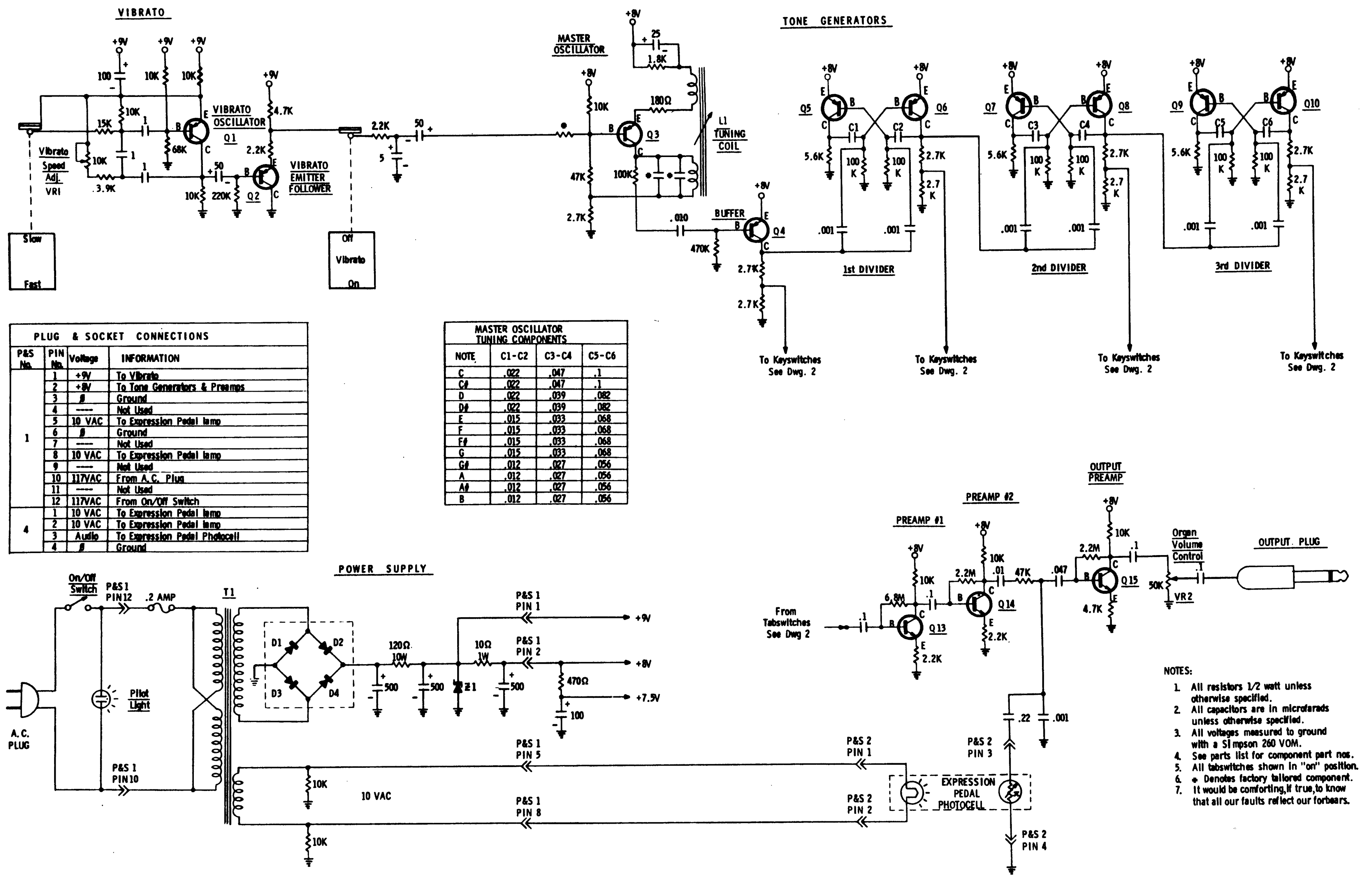
CAUTION

Exercise extreme care when making voltage measurements. Accidental shorting of transistor leads may damage the transistor.

BLOCK DIAGRAM

F.A.S.T. 3


TO AMPLIFIER
PREAMPS
TABSWITCHES
4' KEYSWITCHES
8' KEYSWITCHES
16' KEYSWITCHES
16' BASS DIVIDER
TONE GENERATOR
VIBRATO
LEGEND
SIGNAL FLOW
CONTROL


VIBRATO
+9V
100
10K
15K
1
Vibrato Speed Adj. VR1
3.9K
68K
VIBRATO OSCILLATOR
Q1
50
220K
4.7K
2.2K
VIBRATO EMITTER FOLLOWER
Q2
Slow
Fast
Off
Vibrato
On
5
MASTER OSCILLATOR
+8V
47K
2.7K
25
1.8K
180Ω
Q3
100K
L1 TUNING COIL
.010
470K
BUFFER
Q4
TONE GENERATORS
Q5
Q6
Q7
Q8
Q9
Q10
C1
C2
C3
C4
C5
C6
5.6K
100 K
2.7K
2.7 K
.001
1st DIVIDER
2nd DIVIDER
3rd DIVIDER
To Keyswitches See Dwg. 2
POWER SUPPLY
On/Off Switch
P&S 1 PIN12
.2 AMP
T1
Pilot Light
A.C. PLUG
P&S 1 PIN10
D1
D2
D3
D4
120Ω 10W
10Ω 1W
500
Z1
P&S 1 PIN 1
P&S 1 PIN 2
+9V
+8V
+7.5V
470Ω
100
10K
10 VAC
P&S 1 PIN 5
P&S 1 PIN 8
P&S 2 PIN 1
P&S 2 PIN 2
P&S 2 PIN 3
P&S 2 PIN 4
EXPRESSION PEDAL PHOTOCELL
From Tabswitches See Dwg 2
PREAMP #1
PREAMP #2
OUTPUT PREAMP
Q13
Q14
Q15
6.8M
2.2M
.1
.01
47K
.047
2.2K
4.7K
.22
.001
Organ Volume Control
50K
VR2
OUTPUT PLUG

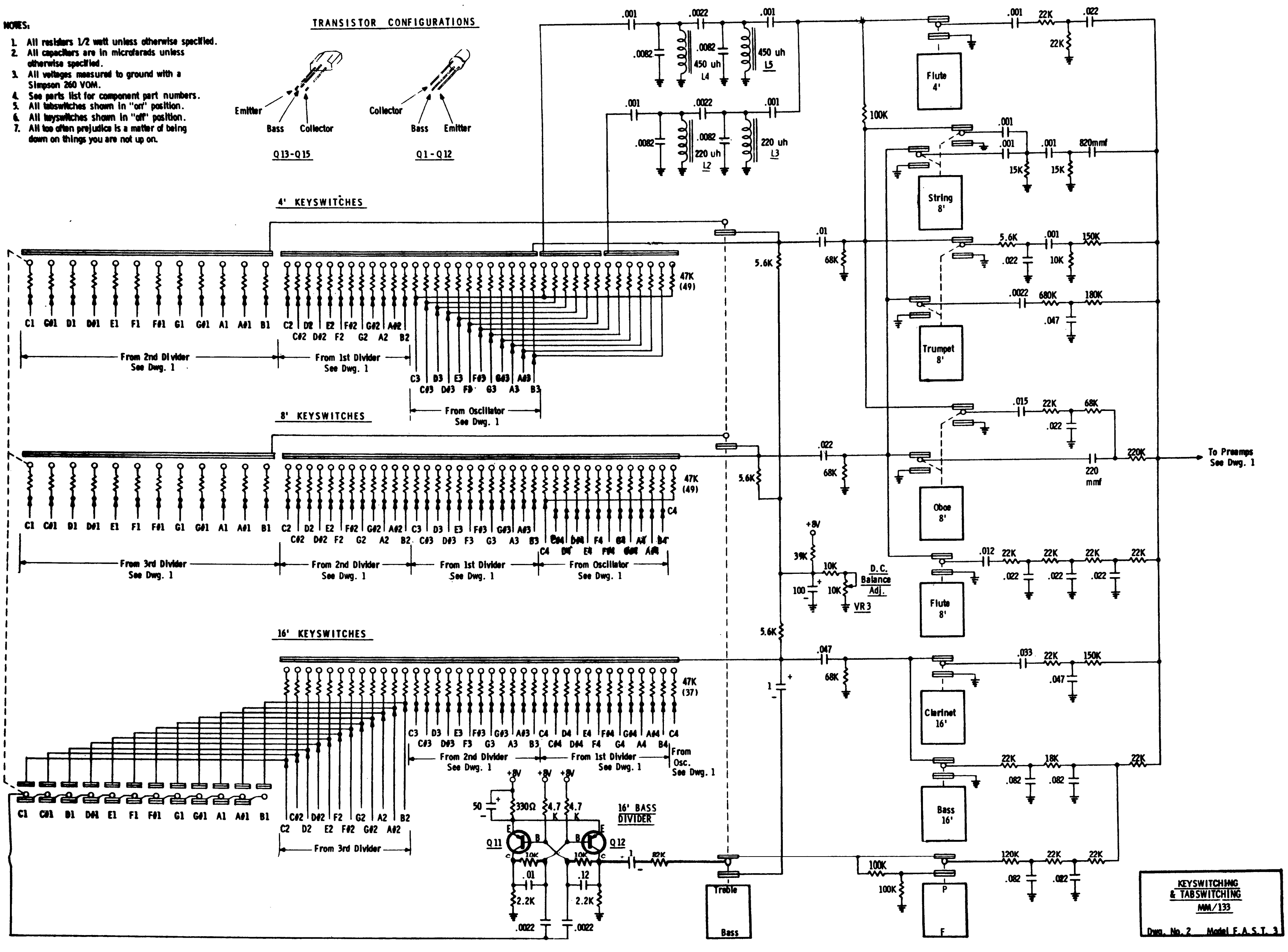
PLUG & SOCKET CONNECTIONS			
P&S No.	PIN No.	Voltage	INFORMATION
1	1	+9V	To Vibrato
	2	+8V	To Tone Generators & Preamps
	3	0	Ground
	4	----	Not Used
	5	10 VAC	To Expression Pedal lamp
	6	0	Ground
	7	----	Not Used
	8	10 VAC	To Expression Pedal lamp
	9	----	Not Used
	10	117VAC	From A.C. Plug
	11	----	Not Used
	12	117VAC	From On/Off Switch
4	1	10 VAC	To Expression Pedal lamp
	2	10 VAC	To Expression Pedal lamp
	3	Audio	To Expression Pedal Photocell
	4	0	Ground

MASTER OSCILLATOR TUNING COMPONENTS			
NOTE	C1-C2	C3-C4	C5-C6
C	.022	.047	.1
C#	.022	.047	.1
D	.022	.039	.082
D#	.022	.039	.082
E	.015	.033	.068
F	.015	.033	.068
F#	.015	.033	.068
G	.015	.033	.068
G#	.012	.027	.056
A	.012	.027	.056
A#	.012	.027	.056
B	.012	.027	.056

NOTES:

1. All resistors 1/2 watt unless otherwise specified.
2. All capacitors are in microfarads unless otherwise specified.
3. All voltages measured to ground with a Simpson 260 VOM.
4. See parts list for component part nos.
5. All tabswitches shown in "on" position.
6. • Denotes factory tailored component.
7. It would be comforting, if true, to know that all our faults reflect our forbears.

TONE GENERATORS,
VIBRATO, PREAMPS
& POWER SUPPLY
MM/133
Dwg. No. 1 Model F.A.S.T.3

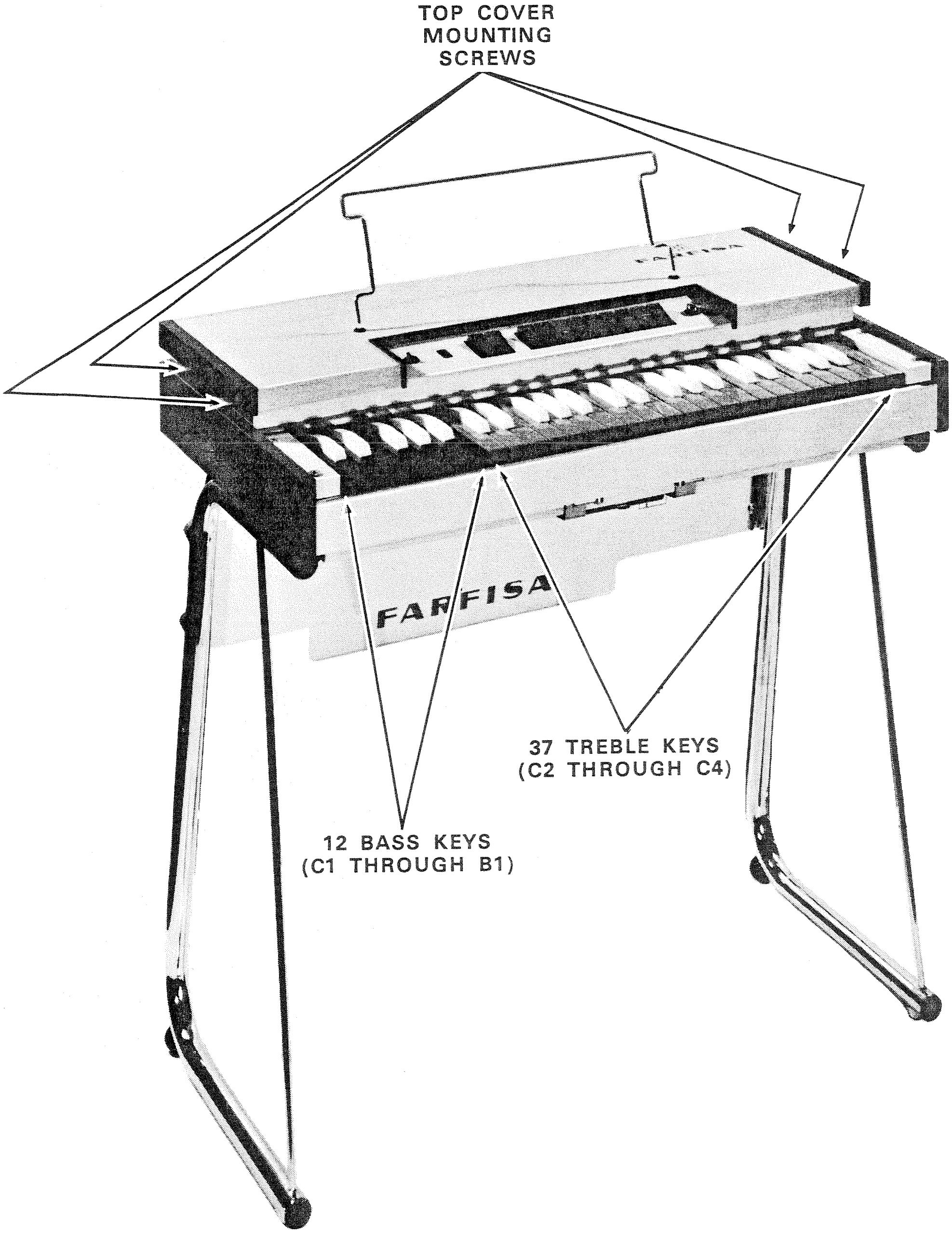

TRANSISTOR CONFIGURATIONS
Emitter
Bass
Collector
Q13-Q15
Collector
Bass
Emitter
Q1-Q12
4' KEYSWITCHES
8' KEYSWITCHES
16' KEYSWITCHES
47K (49)
47K (49)
47K (37)
C1 C#1 D1 D#1 E1 F1 F#1 G1 G#1 A1 A#1 B1
C2 C#2 D2 D#2 E2 F2 F#2 G2 G#2 A2 A#2 B2
C3 C#3 D3 D#3 E3 F3 F#3 G3 G#3 A3 A#3 B3
C4 C#4 D4 D#4 E4 F4 F#4 G4 G#4 A4 A#4 B4
From 2nd Divider See Dwg. 1
From 1st Divider See Dwg. 1
From Oscillator See Dwg. 1
From 3rd Divider See Dwg. 1
From Osc. See Dwg. 1
From 3rd Divider
16' BASS DIVIDER
Q11
Q12
+8V
330Ω
4.7 K
50
10K
2.2K
.01
.12
.0022
82K
Treble
Bass
450 uh L4
450 uh L5
220 uh L2
220 uh L3
.001
.0022
.0082
100K
5.6K
68K
.01
.022
.047
39K
10K
100
D.C. Balance Adj.
VR3
1
Flute 4'
String 8'
Trumpet 8'
Oboe 8'
Flute 8'
Clarinet 16'
Bass 16'
P
F
22K
15K
820mmf
150K
180K
680K
10K
.015
220 mmf
220K
.012
.033
18K
120K
.082
To Preamps See Dwg. 1

NOTES:

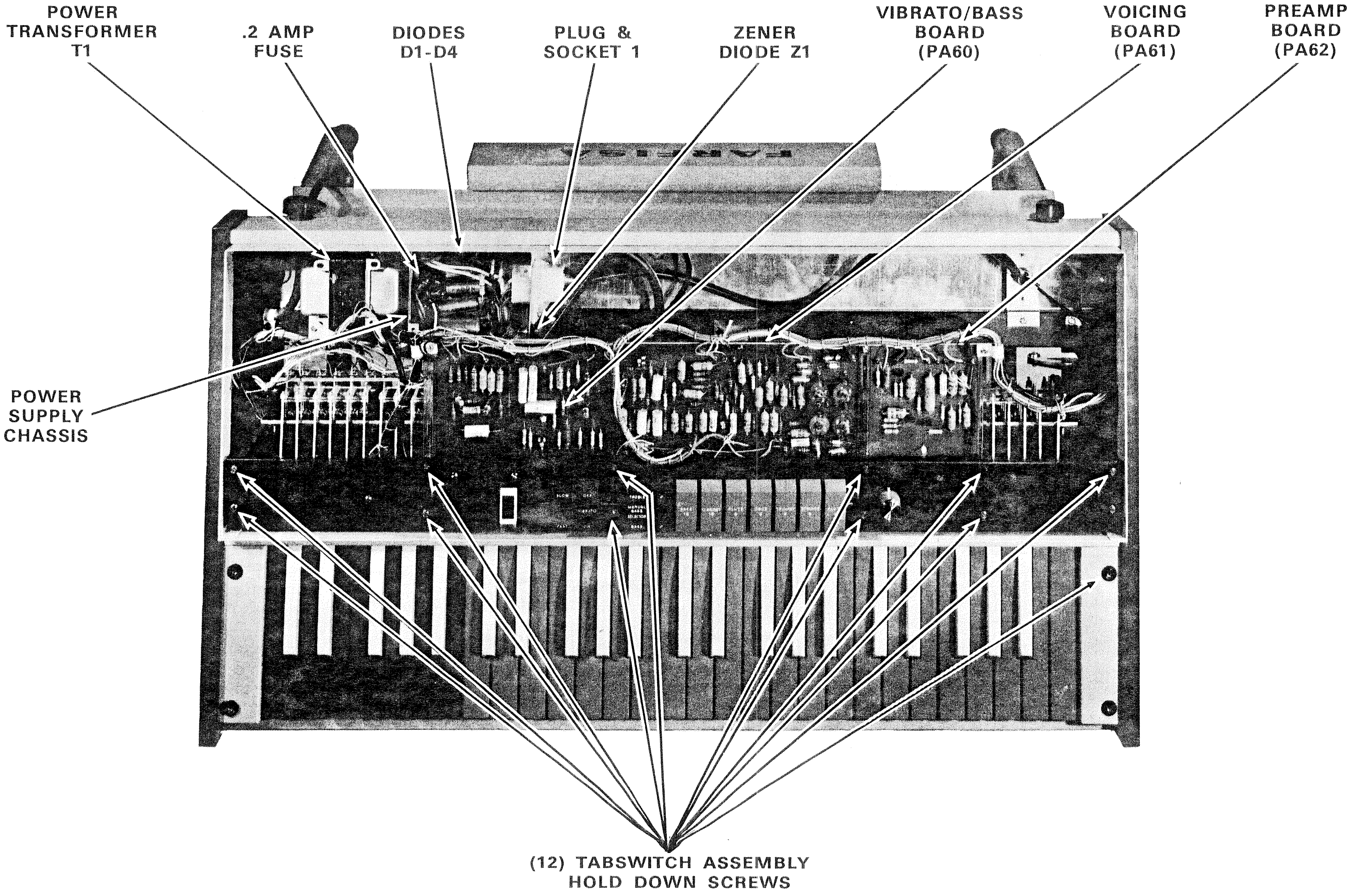
1. All resistors 1/2 watt unless otherwise specified.
2. All capacitors are in microfarads unless otherwise specified.
3. All voltages measured to ground with a Simpson 260 VOM.
4. See parts list for component part numbers.
5. All tabswitches shown in "on" position.
6. All keyswitches shown in "off" position.
7. All too often prejudice is a matter of being down on things you are not up on.

KEYSWITCHING
& TABSWITCHING
MM/133
Dwg. No. 2 Model F.A.S.T. 3

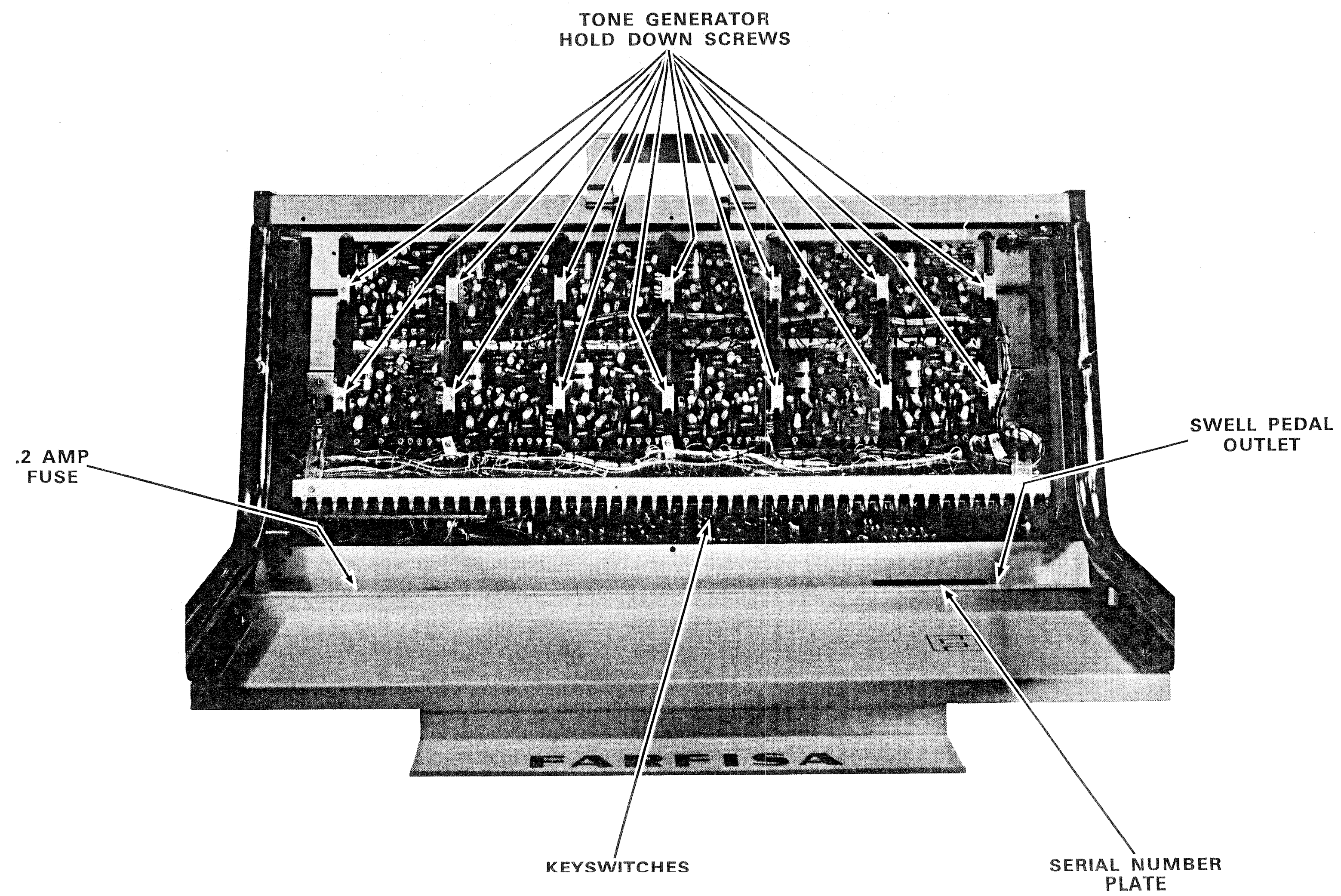
FRONT VIEW
FAST 3


TOP COVER MOUNTING SCREWS
FARFISA
FARFISA
37 TREBLE KEYS (C2 THROUGH C4)
12 BASS KEYS (C1 THROUGH B1)

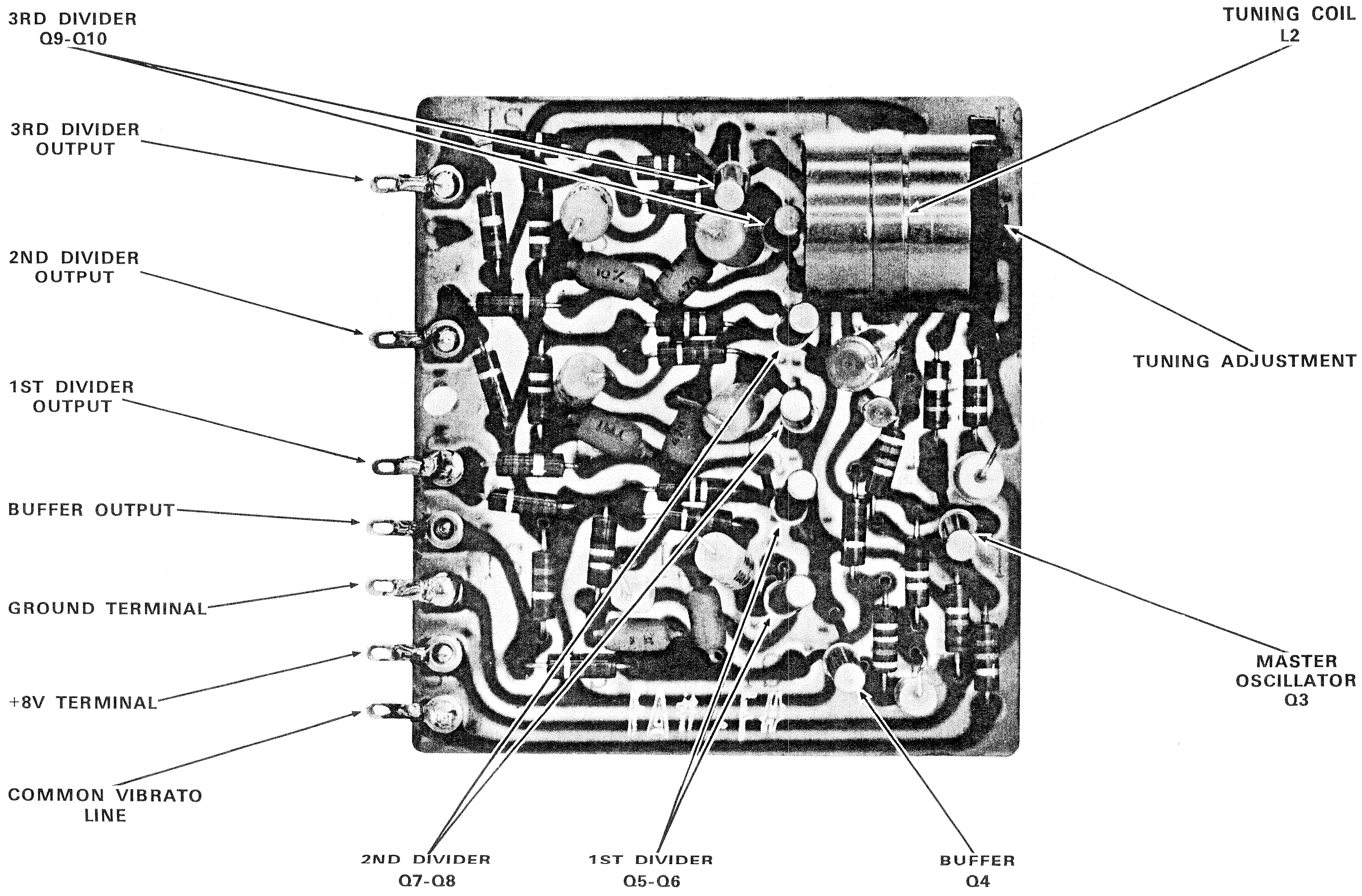
TOP VIEW
FAST 3
(With Cover Removed)


POWER TRANSFORMER T1
.2 AMP FUSE
DIODES D1-D4
PLUG & SOCKET 1
ZENER DIODE Z1
VIBRATO/BASS BOARD (PA60)
VOICING BOARD (PA61)
PREAMP BOARD (PA62)
POWER SUPPLY CHASSIS
(12) TABSWITCH ASSEMBLY HOLD DOWN SCREWS

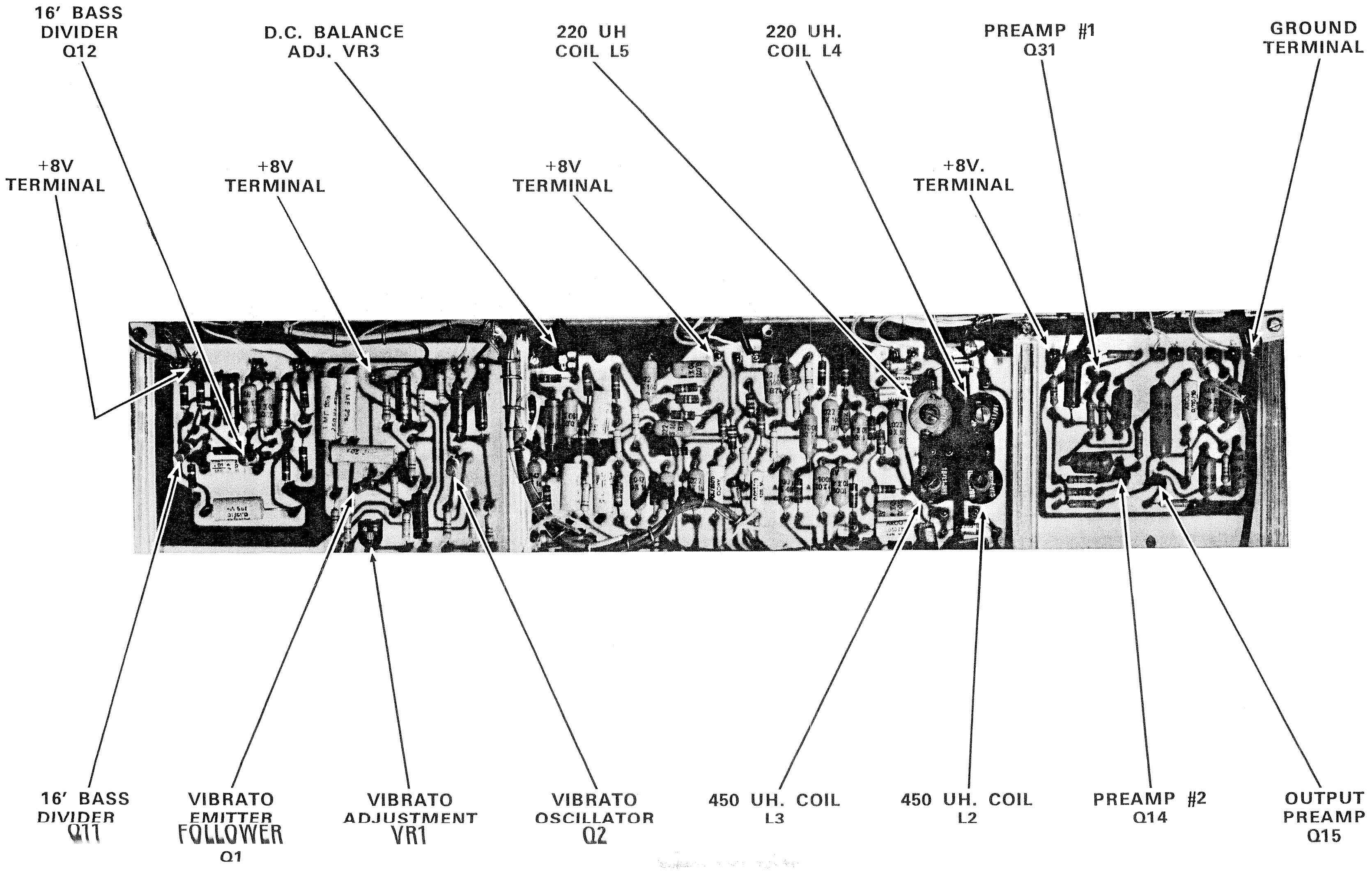
BOTTOM VIEW
FAST 3


TONE GENERATOR HOLD DOWN SCREWS
.2 AMP FUSE
SWELL PEDAL OUTLET
KEYSWITCHES
SERIAL NUMBER PLATE
FARFISA

TONE GENERATOR BOARD
FAST 3
(PA23)


3RD DIVIDER
Q9-Q10
3RD DIVIDER OUTPUT
2ND DIVIDER OUTPUT
1ST DIVIDER OUTPUT
BUFFER OUTPUT
GROUND TERMINAL
+8V TERMINAL
COMMON VIBRATO LINE
2ND DIVIDER
Q7-Q8
1ST DIVIDER
Q5-Q6
BUFFER
Q4
TUNING COIL
L2
TUNING ADJUSTMENT
MASTER OSCILLATOR
Q3

VIBRATO/BASS, VOICING & PREAMP BOARDS
FAST 3


16' BASS DIVIDER Q12
D.C. BALANCE ADJ. VR3
220 UH COIL L5
220 UH. COIL L4
PREAMP #1 Q31
GROUND TERMINAL
+8V TERMINAL
+8V TERMINAL
+8V TERMINAL
+8V. TERMINAL
16' BASS DIVIDER Q11
VIBRATO EMITTER FOLLOWER Q1
VIBRATO ADJUSTMENT VR1
VIBRATO OSCILLATOR Q2
450 UH. COIL L3
450 UH. COIL L2
PREAMP #2 Q14
OUTPUT PREAMP Q15

FAST 4 & 5

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SPECIFICATIONS

Keyboard: C to C
Manual Bass: C1 to B1
Extended Bass: C2 to B2

Voice Stops (violet tabs):

Bass	16′
Bass Clarinet	16′
Flute	8′
Oboe	8′
Trumpet	8′
Strings	8′
Flute	4′
Piccolo	4′

Mixture Stops (violet tabs):
- Mixture (mixed frequencies of 5-1/3′ and 2-2/3′)
- Mixture: Brilliant

Vibrato Stops (blue tabs):
- Vibrato On/Off
- Slow / Fast
- Light / Heavy

Percussion Stops (orange tabs):
- Manual Bass On/Off
- Treble On/Off
- Long / Short
- Mixture On/Off
- Mixture Soft / Sharp

Sustain Stops (yellow tabs) Fast 5 Only:

Celest	8′
Clavicord	8′
Kinura	8′

Manual Bass Selector (dark-grey tab):

Bass / Treble

Pedal and Manual Bass Sound (black tab):

Soft / Sharp

Rotating General Volume Control

Swell Pedal Volume Control

Mains Switch and Pilot Light

Mains Voltage: 117 Volt AC

Dimensions: 37″ x 17″ x 36″

Weight: 62 lbs.

Metal cabinet covered with washable vinyl—plastic edges—chromed folding legs—retractable carrying handle—removable music rack—socket for headphone—socket for the connection of an optional 13-note pedalboard—carrying bag supplied with the instrument.

ADJUSTMENTS
FAST 4 & 5

VR1 VIBRATO SPEED

Vibrato speed may be adjusted using a small regular screwdriver. Proper speed is between 6-7 Hertz with the Vibrato speed tabswitch set in the Fast position.

VR2 VOLTAGE

This adjustment is carefully set at the factory! Readjustment should not be necessary unless Power Supply components are replaced. To adjust, connect a D.C. voltmeter to supply voltage "A", then set the adjustment so that the meter reads +12 volts. Improper voltage adjustment will result in unstable tone generator operation. Always check the "A" supply voltage before servicing tone generators.

VR3 STABILITY

The stability adjustment is carefully set at the factory! Readjustment should not be necessary unless Power Supply components are replaced. This adjustment has a wide range of normal operation. Only extreme settings on this adjustment will result in unstable Power Supply operation.

VR5-VR9, VR12 & VR13 FILTERS

These adjustments are carefully set at the factory! Readjustment should not be necessary unless Filter components are replaced. To adjust a filter: First, connect an A.C. voltmeter across the speakers in the amplifier to which the organ is connected. Then, with a clip lead, ground the transistor collector lead of the filter requiring adjustment. While the filter is grounded—and using one flute tabswitch at a time—locate a group of dead keys on the keyboard and hold down one key at or near the center of this group. Next, while holding the note, remove the clip lead from the filter transistor. Now with the note playing, adjust the A.C. meter range so that the meter needle reads near center scale. (Use any meter range and organ volume combination that is convenient.) With the note still playing, set the filter adjustment to a point that gives the maximum increase in A.C. voltage.

VR10, VR11 PERCUSSION LENGTH & ATTACK

These two adjustments affect each other. Adjustment of either one changes the other. Proper adjustment is achieved when the percussion functions with the least key pop and with a distinct difference in percussion length between short and long percussion tabswitch settings. Extreme adjustment of either length or attack will result in **no percussion.** Always try adjusting percussion before servicing the percussion circuits.

L1 TUNING

The 12 Tone Generator Master Oscillator circuits determine the pitch of the entire organ. Adjusting any one of the Master Oscillator tuning adjustments will tune all the notes of that tone generator. Tuning any group of 12 notes automatically tunes the entire organ.

Tuning may be accomplished by using a small non-conductive screwdriver and one of the following methods:

1. Set of 12 Tuning Forks: Zero beat the note of the organ to be tuned to the sound of the corresponding tuning fork. This is a highly accurate method for tuning.
2. Strobo Conn or Strobo Tuner: This is done by visual observation of a strob pattern. Simply follow directions supplied with the Strobotuner. This is a highly accurate tuning method.
3. Another instrument: Zero beat the note of the organ to be tuned to the sound of a corresponding note on an "in tune" instrument (piano, organ, accordion, etc.) Accuracy is dependent upon the tuning of the other instruments. This method is especially desirable when the other instrument is to be played with the organ.
4. One Tuning Fork: One tuning fork is used to set the "temperment" (one note). The other 11 notes are set by ear using the number of beats between "4ths" and "5ths". This requires a trained ear. Accuracy is dependent upon the tuner.

FAST 4 & 5

TRANSISTOR VOLTAGES

Q No.	Circuit	Collector	Emitter	Base
Q1	Master Oscillator	+2.2	+12	+12
Q2	1st Divider	+5.5	+1	+1.2
Q3	1st Divider	+5.5	+1	+1.2
Q4	2nd Divider	+5.5	+1	+1.2
Q5	2nd Divider	+5.5	+1	+1.2
Q6	3rd Divider	+5.5	+1	+1.2
Q7	3rd Divider	+5.5	+1	+1.2
Q8	4th Divider	+5.5	+1	+1.2
Q9	4th Divider	+5.5	+1	+1.2
Q10	5th Divider	+5.5	+1	+1.2
Q11	5th Divider	+5.5	+1	+1.2
Q12	Vibrato Oscillator	+5.2*	+2.6	+2.8
Q13	Emitter Follower	+12	+4.5*	+1.8*
Q14	Voltage Sensor	—12	+5.6	+5
Q15	Voltage Regulator	0	—12	—12
Q16	Voltage Regulator	0	—12	—12
Q17	16′ Solo Divider	+10/+5.5	+1	+1.8/+1.3
Q18	16′ Solo Divider	+1.2/+5.5	+1	+.9/+1.3
Q19	Pedal Solo Divider	+1/+5.5	+1	+1.8/+1.3
Q20	Pedal Solo Divider	+10/+5.5	+1	+.9/+1.3
Q21	Bass Preamp	+5.5	+.8	+1
Q22	3320 Cycles Flute Filter	+5.5	+.8	+1
Q23	1660 Cycles Flute Filter	+5.5	+.8	+1
Q24	830 Cycles Flute Filter	+5.5	+.8	+1
Q25	415 Cycles Flute Filter	+5.5	+.8	+1
Q26	207 Cycles Flute Filter	+5.5	+.8	+1
Q27	String Preamp	+3.6	+1.1	+1.2
Q27	String Preamp	+5.8	+.6	+1
Q28	Trumpet Filter	+6	+.6	+1
Q29	Oboe Filter	+5.8	+.6	+1
Q30	Treble Preamp	+5.6	+.6	+1
Q31	Percussion Pulse Detector	+.8	+.5	+1.2
Q32	1 Shot Multivibrator	+.1	0	+.3
Q33	1 Shot Multivibrator	+11.2	0	+.1
Q34	Percussion Driver	0	+9.5	+10
Q35	Percussion Keyer	+11.5	+11.5	0
Q36	Percussion Preamp	+6	+.7	+1.2
Q37	Output Preamp	+9	+3	+3.3
Q38	Celest Filter #1	+5.8	+.6	+1
Q39	Celest Filter #2	+5.8	+.6	+1
Q40	Sustain Voice Preamp #1	+5.8	+.6	+1
Q41	Sustain Preamp #2	+6	+.6	+1
Q42	16′ Solo Preamp	+12/+5.5	0	0/+.6
Q43	Muter Preamp #1	+5.6	+.6	+1
Q44	Muter Preamp #2	+9	+6.2	+5.6
Q45	Muter Driver	+6.5	0	0
Q46	Muter	0	0	+.5

*PulseVoltage

IMPORTANT

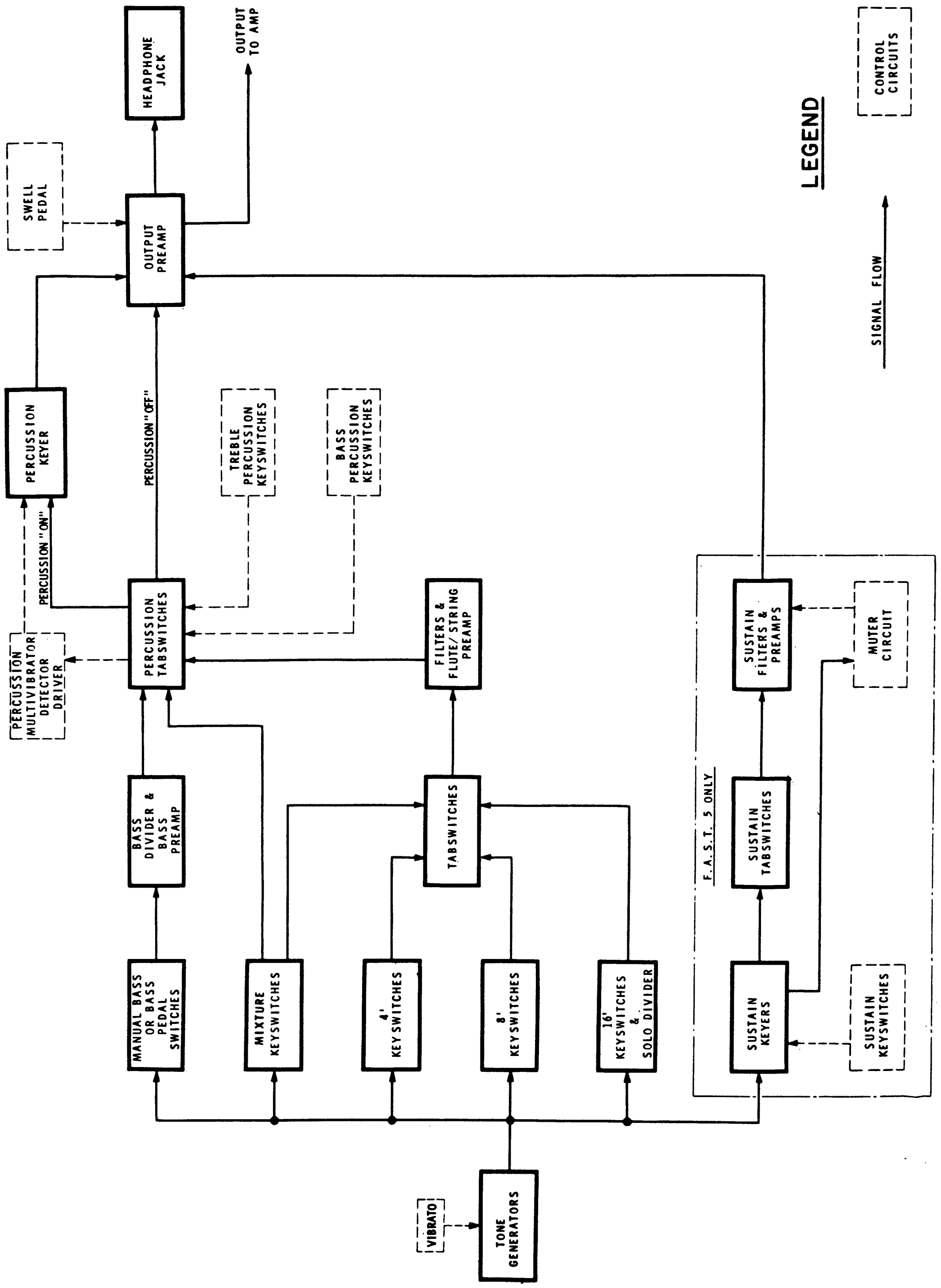
The above voltage readings were measured to ground with a Simpson Model 260 V.O.M. Voltage readings shown are intended only as a guide in troubleshooting. Voltages will vary from organ to organ due to normal manufacturing tolerances.

CAUTION

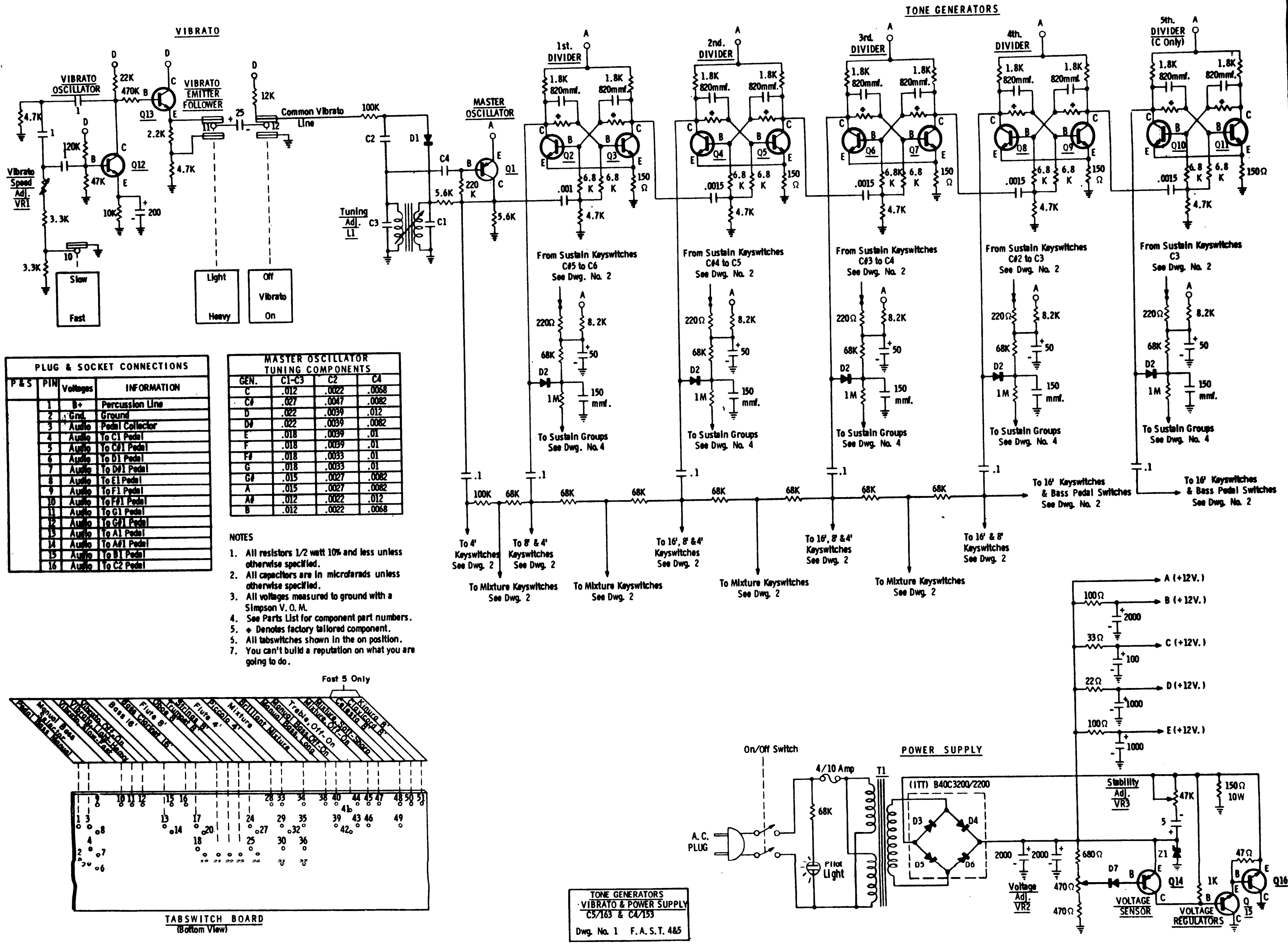
Exercise extreme care when making voltage measurements. Accidental shorting of transistor leads may damage the transistor.

BLOCK DIAGRAM

F.A.S.T. 4&5


HEADPHONE JACK
OUTPUT TO AMP
SWELL PEDAL
OUTPUT PREAMP
PERCUSSION KEYER
PERCUSSION "OFF"
TREBLE PERCUSSION KEYSWITCHES
BASS PERCUSSION KEYSWITCHES
PERCUSSION "ON"
PERCUSSION MULTIVIBRATOR DETECTOR DRIVER
PERCUSSION TABSWITCHES
FILTERS & FLUTE/STRING PREAMP
BASS DIVIDER & BASS PREAMP
TABSWITCHES
MANUAL BASS OR BASS PEDAL SWITCHES
MIXTURE KEYSWITCHES
4' KEYSWITCHES
8' KEYSWITCHES
16' KEYSWITCHES & SOLO DIVIDER
TONE GENERATORS
VIBRATO
F.A.S.T. 5 ONLY
SUSTAIN FILTERS & PREAMPS
MUTER CIRCUIT
SUSTAIN TABSWITCHES
SUSTAIN KEYERS
SUSTAIN KEYSWITCHES
LEGEND
SIGNAL FLOW
CONTROL CIRCUITS

FAST 4 & 5


VIBRATO
VIBRATO OSCILLATOR
Vibrato Speed Adj. VR1
Q12
Q13
VIBRATO EMITTER FOLLOWER
Common Vibrato Line
Slow
Fast
Light
Heavy
Off
Vibrato
On
Tuning Adj. L1
C1
C2
C3
C4
D1
MASTER OSCILLATOR
Q1
TONE GENERATORS
1st. DIVIDER
2nd. DIVIDER
3rd. DIVIDER
4th. DIVIDER
5th. DIVIDER (C Only)
Q2
Q3
Q4
Q5
Q6
Q7
Q8
Q9
Q10
Q11
1.8K
820mmf.
6.8 K
150 Ω
4.7K
.001
.0015
From Sustain Keyswitches C#5 to C6 See Dwg. No. 2
From Sustain Keyswitches C#4 to C5 See Dwg. No. 2
From Sustain Keyswitches C#3 to C4 See Dwg. No. 2
From Sustain Keyswitches C#2 to C3 See Dwg. No. 2
From Sustain Keyswitches C3 See Dwg. No. 2
220Ω
8.2K
68K
50
D2
1M
150 mmf.
To Sustain Groups See Dwg. No. 4
100K
68K
To 4' Keyswitches See Dwg. 2
To 8' & 4' Keyswitches See Dwg. 2
To 16', 8' & 4' Keyswitches See Dwg. 2
To 16' & 8' Keyswitches See Dwg. 2
To 16' Keyswitches & Bass Pedal Switches See Dwg. No. 2
To Mixture Keyswitches See Dwg. 2
Fast 5 Only
Pedal Bass Manual
Manual Bass Selector
Vibrato, Slow-Fast
Vibrato, Light-Heavy
Vibrato, Off-On
Bass 16'
Bass Clarinet 16'
Flute 8'
Oboe 8'
Trumpet 8'
Strings 8'
Flute 4'
Piccolo 4'
Mixture
Brilliant Mixture
Manual Bass, Long
Manual Bass, Off-On
Treble, Off-On
Mixture, Off-On
Mixture, Soft-Sharp
Celesta 8'
Clavicord 8'
Kinura 8'
TABSWITCH BOARD (Bottom View)
On/Off Switch
A.C. PLUG
4/10 Amp
T1
Pilot Light
POWER SUPPLY
(ITT) B40C3200/2200
D3
D4
D5
D6
2000
Voltage Adj. VR2
470Ω
680Ω
D7
Q14
VOLTAGE SENSOR
Z1
Stability Adj. VR3
47K
150Ω 10W
47Ω
1K
Q15
Q16
VOLTAGE REGULATORS
A (+12V.)
B (+12V.)
C (+12V.)
D (+12V.)
E (+12V.)
100Ω
33Ω
22Ω
100
1000

PLUG & SOCKET CONNECTIONS			
P & S	PIN	Voltages	INFORMATION
	1	B+	Percussion Line
	2	Gnd.	Ground
	3	Audio	Pedal Collector
	4	Audio	To C1 Pedal
	5	Audio	To C#1 Pedal
	6	Audio	To D1 Pedal
	7	Audio	To D#1 Pedal
	8	Audio	To E1 Pedal
	9	Audio	To F1 Pedal
	10	Audio	To F#1 Pedal
	11	Audio	To G1 Pedal
	12	Audio	To G#1 Pedal
	13	Audio	To A1 Pedal
	14	Audio	To A#1 Pedal
	15	Audio	To B1 Pedal
	16	Audio	To C2 Pedal

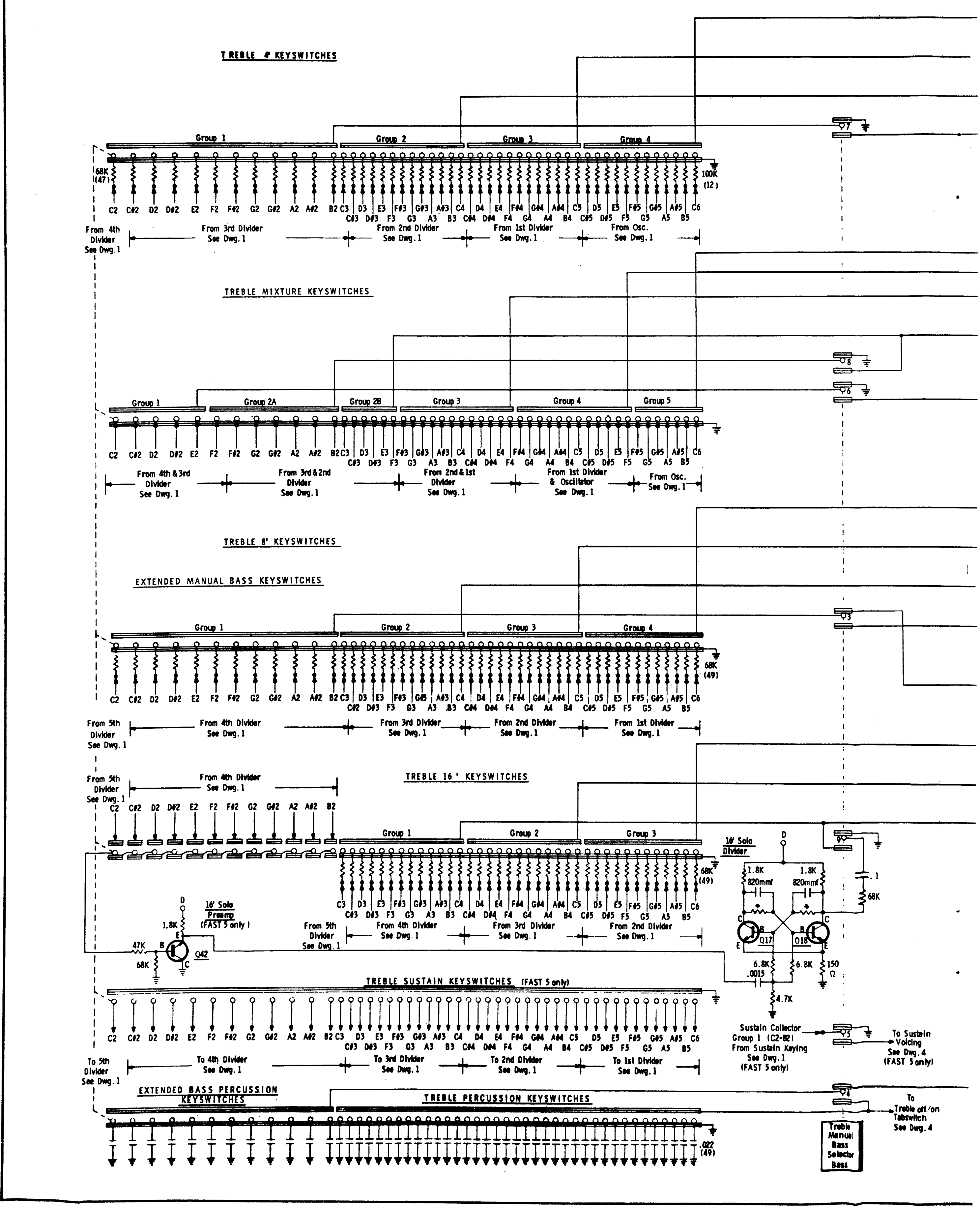
MASTER OSCILLATOR TUNING COMPONENTS			
GEN.	C1-C3	C2	C4
C	.012	.0022	.0068
C#	.027	.0047	.0082
D	.022	.0039	.012
D#	.022	.0039	.0082
E	.018	.0039	.01
F	.018	.0039	.01
F#	.018	.0033	.01
G	.018	.0033	.01
G#	.015	.0027	.0082
A	.015	.0027	.0082
A#	.012	.0022	.012
B	.012	.0022	.0068

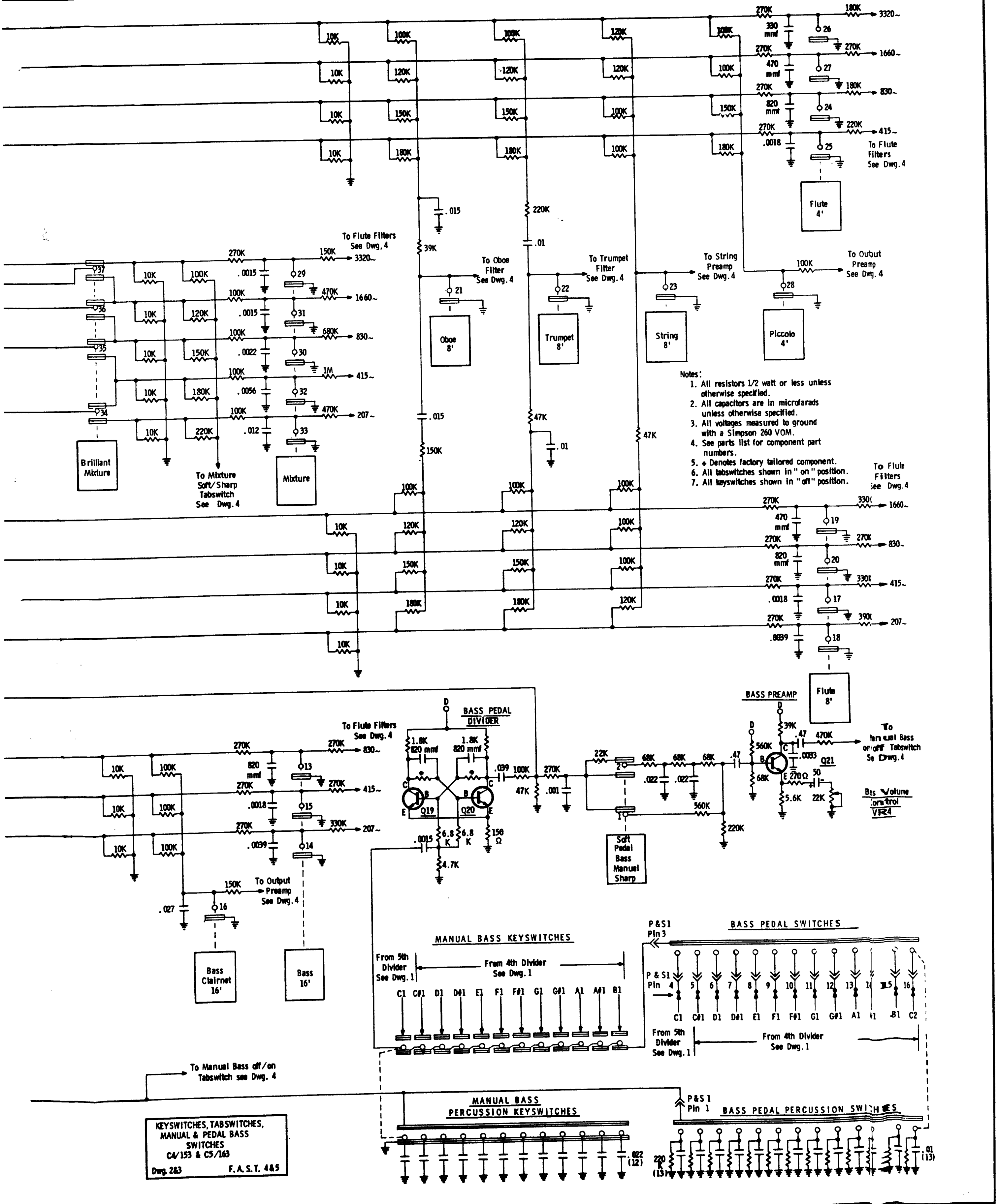
NOTES

1. All resistors 1/2 watt 10% and less unless otherwise specified.
2. All capacitors are in microfarads unless otherwise specified.
3. All voltages measured to ground with a Simpson V. O. M.
4. See Parts List for component part numbers.
5. + Denotes factory tailored component.
6. All tabswitches shown in the on position.
7. You can't build a reputation on what you are going to do.

TONE GENERATORS
· VIBRATO & POWER SUPPLY
C5/163 & C4/153
Dwg. No. 1 F. A. S. T. 4&5

FAST 4 & 5


TREBLE 4' KEYSWITCHES
Group 1
Group 2
Group 3
Group 4
68K (47)
100K (12)
C2 C#2 D2 D#2 E2 F2 F#2 G2 G#2 A2 A#2 B2 C3 D3 E3 F#3 G#3 A#3 C4 D4 E4 F#4 G#4 A#4 C5 D5 E5 F#5 G#5 A#5 C6
C#3 D#3 F3 G3 A3 B3 C#4 D#4 F4 G4 A4 B4 C#5 D#5 F5 G5 A5 B5
From 4th Divider See Dwg. 1
From 3rd Divider See Dwg. 1
From 2nd Divider See Dwg. 1
From 1st Divider See Dwg. 1
From Osc. See Dwg. 1
7
TREBLE MIXTURE KEYSWITCHES
Group 1
Group 2A
Group 2B
Group 3
Group 4
Group 5
8
6
From 4th & 3rd Divider See Dwg. 1
From 3rd & 2nd Divider See Dwg. 1
From 2nd & 1st Divider See Dwg. 1
From 1st Divider & Oscillator See Dwg. 1
From Osc. See Dwg. 1
TREBLE 8' KEYSWITCHES
EXTENDED MANUAL BASS KEYSWITCHES
Group 1
Group 2
Group 3
Group 4
3
68K (49)
From 5th Divider See Dwg. 1
From 4th Divider See Dwg. 1
From 3rd Divider See Dwg. 1
From 2nd Divider See Dwg. 1
From 1st Divider See Dwg. 1
TREBLE 16' KEYSWITCHES
From 5th Divider See Dwg. 1
From 4th Divider See Dwg. 1
Group 1
Group 2
Group 3
68K (49)
16' Solo Preamp (FAST 5 only)
D
1.8K
47K
68K
B
E
C
Q42
From 5th Divider See Dwg. 1
From 4th Divider See Dwg. 1
From 3rd Divider See Dwg. 1
From 2nd Divider See Dwg. 1
16' Solo Divider
D
1.8K
820mmf
1.8K
820mmf
Q17
Q18
6.8K
.0015
6.8K
150 Ω
4.7K
9
.1
68K
TREBLE SUSTAIN KEYSWITCHES (FAST 5 only)
To 5th Divider See Dwg. 1
To 4th Divider See Dwg. 1
To 3rd Divider See Dwg. 1
To 2nd Divider See Dwg. 1
To 1st Divider See Dwg. 1
Sustain Collector Group 1 (C2-B2) From Sustain Keying See Dwg. 1 (FAST 5 only)
5
To Sustain Voicing See Dwg. 4 (FAST 5 only)
EXTENDED BASS PERCUSSION KEYSWITCHES
TREBLE PERCUSSION KEYSWITCHES
4
To Treble off/on Tabswitch See Dwg. 4
.022 (49)
Treble Manual Bass Selector Bass

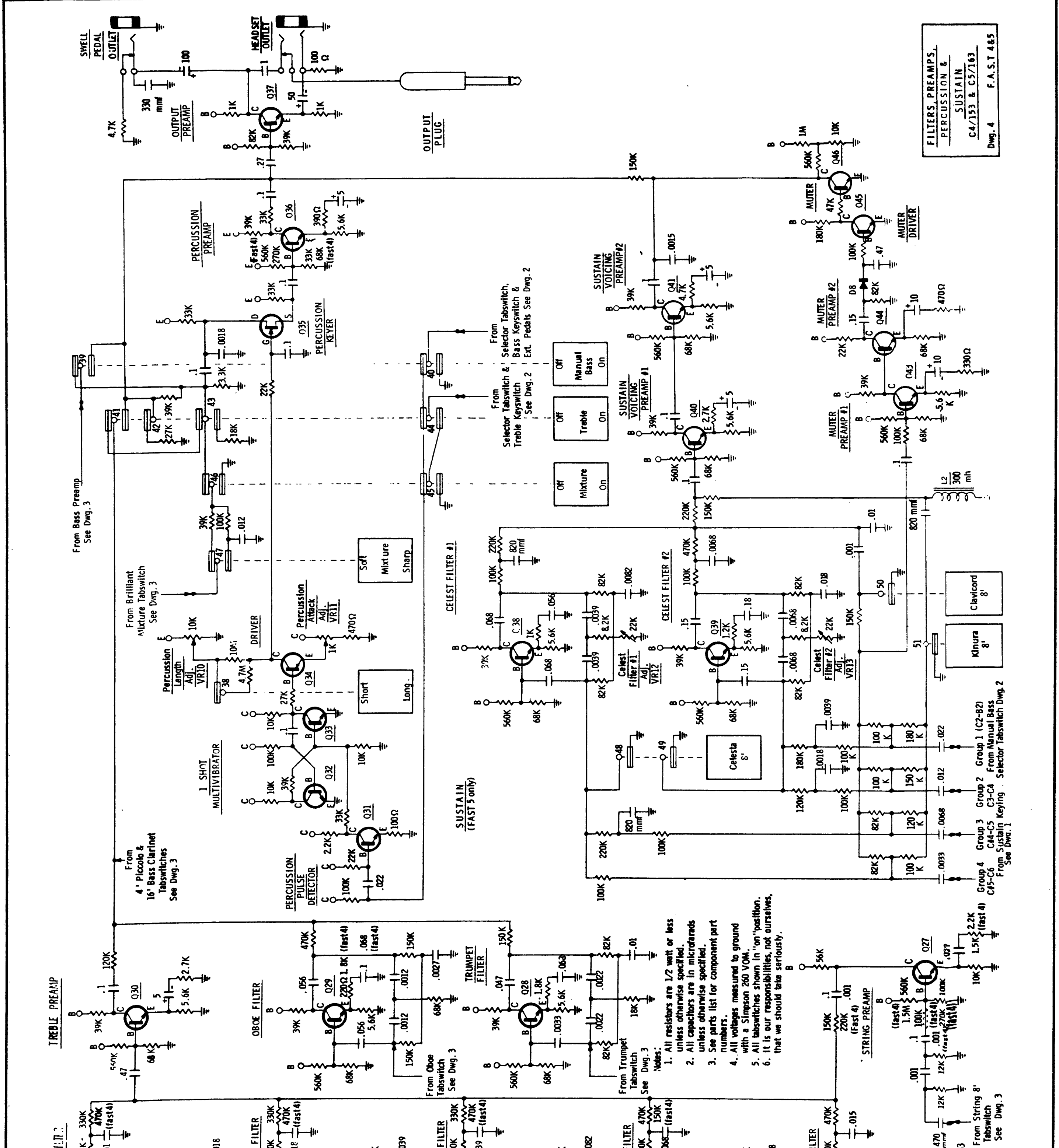

3320~
1660~
830~
415~
207~
To Flute Filters See Dwg. 4
Flute 4'
To Oboe Filter See Dwg. 4
Oboe 8'
To Trumpet Filter See Dwg. 4
Trumpet 8'
To String Preamp See Dwg. 4
String 8'
To Output Preamp See Dwg. 4
Piccolo 4'
Brilliant Mixture
To Mixture Soft/Sharp Tabswitch See Dwg. 4
Mixture
Flute 8'
BASS PEDAL DIVIDER
Q19
Q20
BASS PREAMP
Q21
To Manual Bass on/off Tabswitch See Dwg. 4
Bass Volume Control VR4
Soft Pedal Bass Manual Sharp
Bass Clairnet 16'
Bass 16'
MANUAL BASS KEYSWITCHES
From 5th Divider See Dwg. 1
From 4th Divider See Dwg. 1
C1 C#1 D1 D#1 E1 F1 F#1 G1 G#1 A1 A#1 B1
P&S1 Pin 3
P & S1 Pin 4
BASS PEDAL SWITCHES
C1 C#1 D1 D#1 E1 F1 F#1 G1 G#1 A1 A#1 B1 C2
To Manual Bass off/on Tabswitch see Dwg. 4
MANUAL BASS PERCUSSION KEYSWITCHES
P&S1 Pin 1
BASS PEDAL PERCUSSION SWITCHES

Notes:

1. All resistors 1/2 watt or less unless otherwise specified.
2. All capacitors are in microfarads unless otherwise specified.
3. All voltages measured to ground with a Simpson 260 VOM.
4. See parts list for component part numbers.
5. ✚ Denotes factory tailored component.
6. All tabswitches shown in "on" position.
7. All keyswitches shown in "off" position.

KEYSWITCHES, TABSWITCHES,
MANUAL & PEDAL BASS
SWITCHES
C4/153 & C5/163
Dwg. 2&3 F.A.S.T. 4&5

FAST 4 & 5


SWELL PEDAL OUTLET
HEADSET OUTLET
OUTPUT PREAMP
Q37
OUTPUT PLUG
PERCUSSION PREAMP
Q36
PERCUSSION KEYER
Q35
From Selector Tabswitch & Bass Keyswitch & Ext. Pedals See Dwg. 2
From Selector Tabswitch & Treble Keyswitch See Dwg. 2
Off Manual Bass On
Off Treble On
Off Mixture On
From Bass Preamp See Dwg. 3
From Brilliant Mixture Tabswitch See Dwg. 3
Soft Mixture Sharp
Percussion Length Adj. VR10
Percussion Attack Adj. VR11
DRIVER
Q34
Short Long
1 SHOT MULTIVIBRATOR
Q33
Q32
Q31
PERCUSSION PULSE DETECTOR
From 4' Piccolo & 16' Bass Clarinet Tabswitches See Dwg. 3
SUSTAIN (FAST 5 only)
SUSTAIN VOICING PREAMP #2
Q41
SUSTAIN VOICING PREAMP #1
Q40
CELEST FILTER #1
Q38
Celest Filter #1 Adj. VR12
CELEST FILTER #2
Q39
Celest Filter #2 Adj. VR13
Celesta 8'
MUTER
Q46
MUTER DRIVER
Q45
MUTER PREAMP #2
Q44
MUTER PREAMP #1
Q43
D8
L2 300 mh
Clavicord 8'
Kinura 8'
Group 1 (C2-B2) From Manual Bass Selector Tabswitch Dwg. 2
Group 2 C3-C4
Group 3 C#4-C5 From Sustain Keying See Dwg. 1
Group 4 C#5-C6
TREBLE PREAMP
Q30
OBOE FILTER
Q29
From Oboe Tabswitch See Dwg. 3
TRUMPET FILTER
Q28
From Trumpet Tabswitch See Dwg. 3
STRING PREAMP
Q27
From String 8' Tabswitch See Dwg. 3
3320~ FLUTE FILTER
Q22
3320~ Filter Adj. VR5
1660~ FLUTE FILTER
Q23
1660~ Filter Adj. VR6
830~ FLUTE FILTER
Q24
830~ Filter Adj. VR7
415~ FLUTE FILTER
Q25
415~ Filter Adj. VR8
207~ FLUTE FILTER
Q26
207~ Filter Adj. VR9
From Flute Tabswitches See Dwg. 3
(fast 4)

Notes:

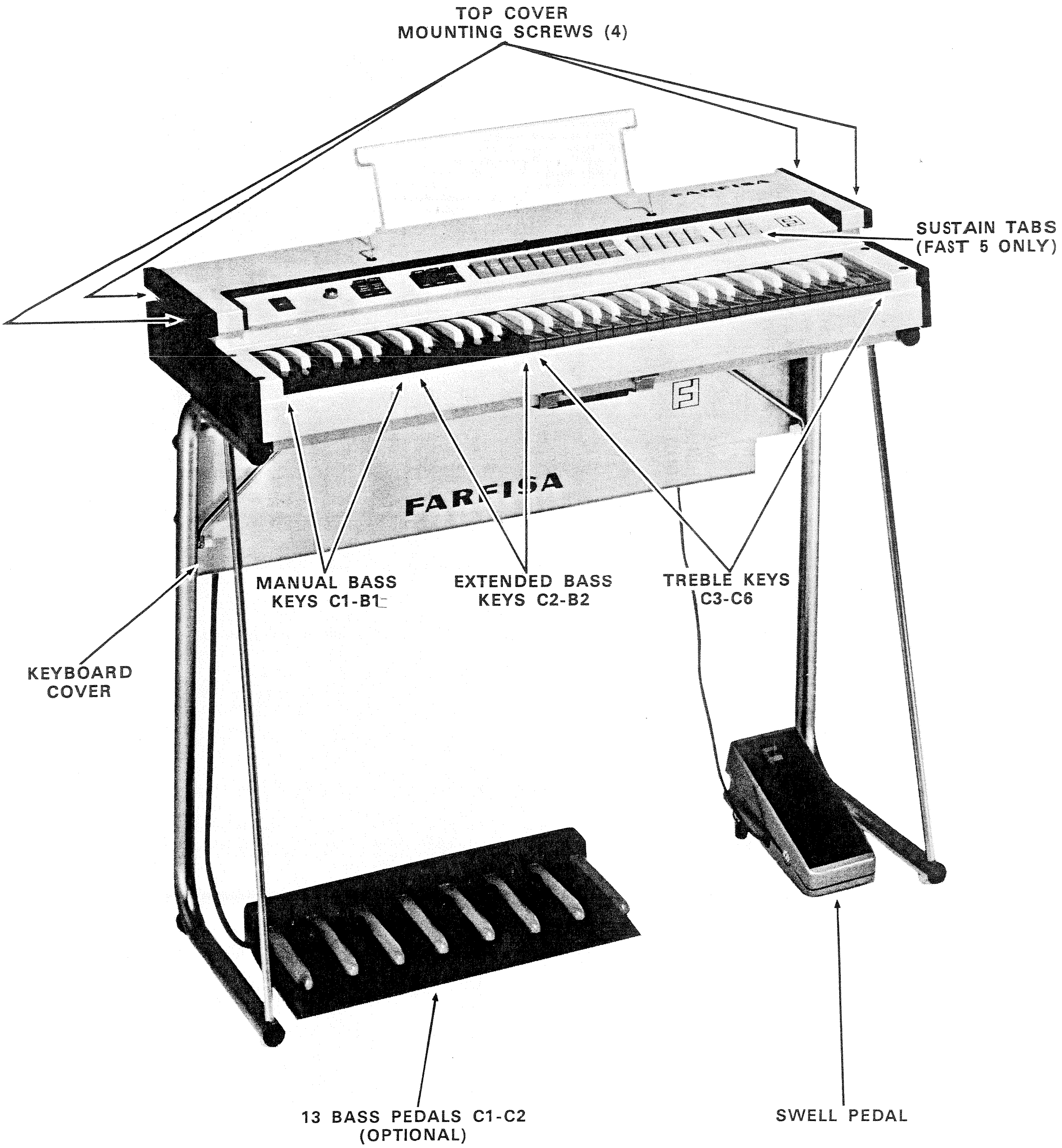
1. All resistors are 1/2 watt or less unless otherwise specified.
2. All capacitors are in microfarads unless otherwise specified.
3. See parts list for component part numbers.
4. All voltages measured to ground with a Simpson 260 VOM.
5. All tabswitches shown in "on" position.
6. It is our responsibilities, not ourselves, that we should take seriously.

FILTERS, PREAMPS, PERCUSSION & SUSTAIN

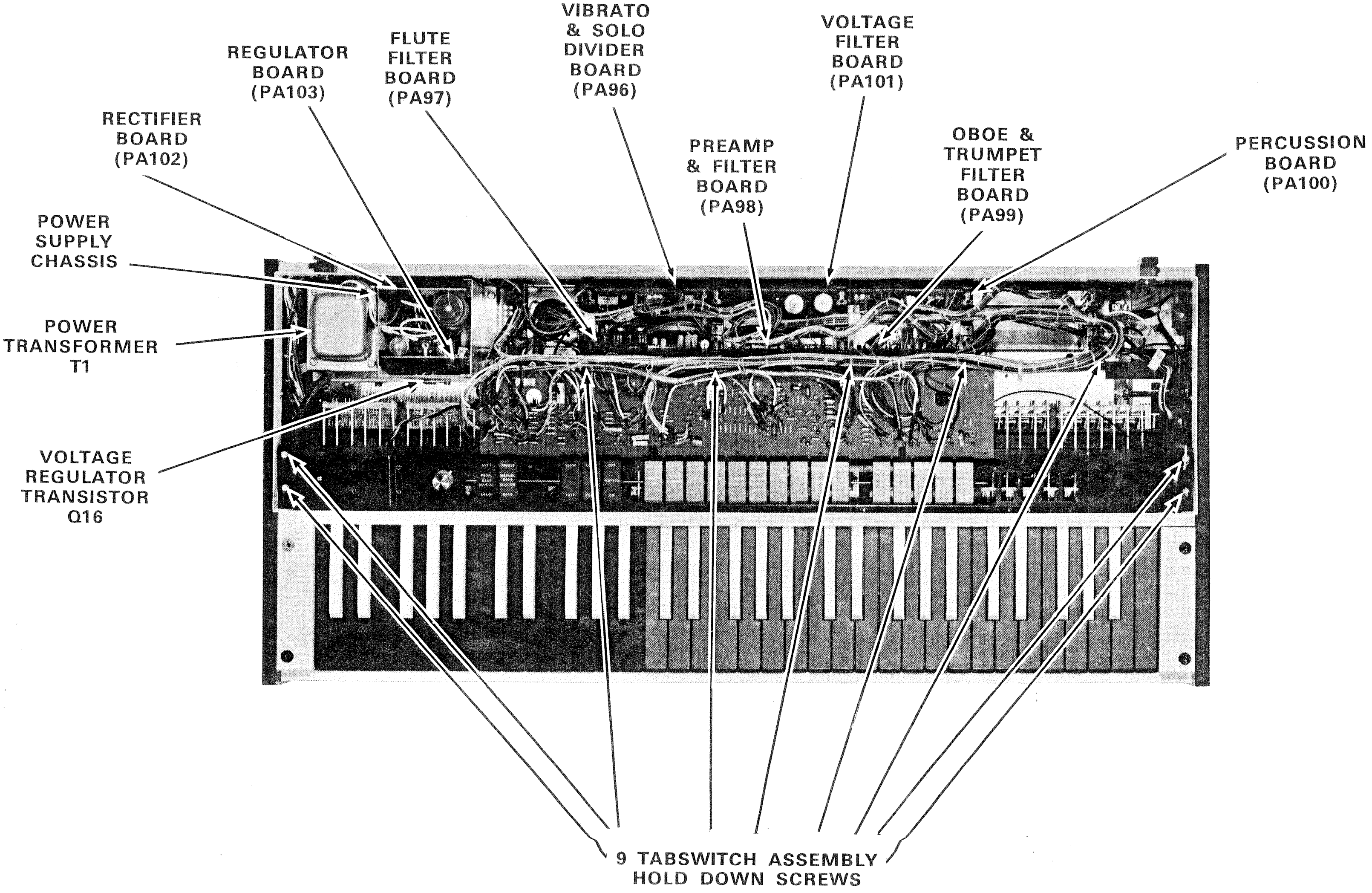
C4/153 & C5/163

Dwg. 4 F.A.S.T 4&5

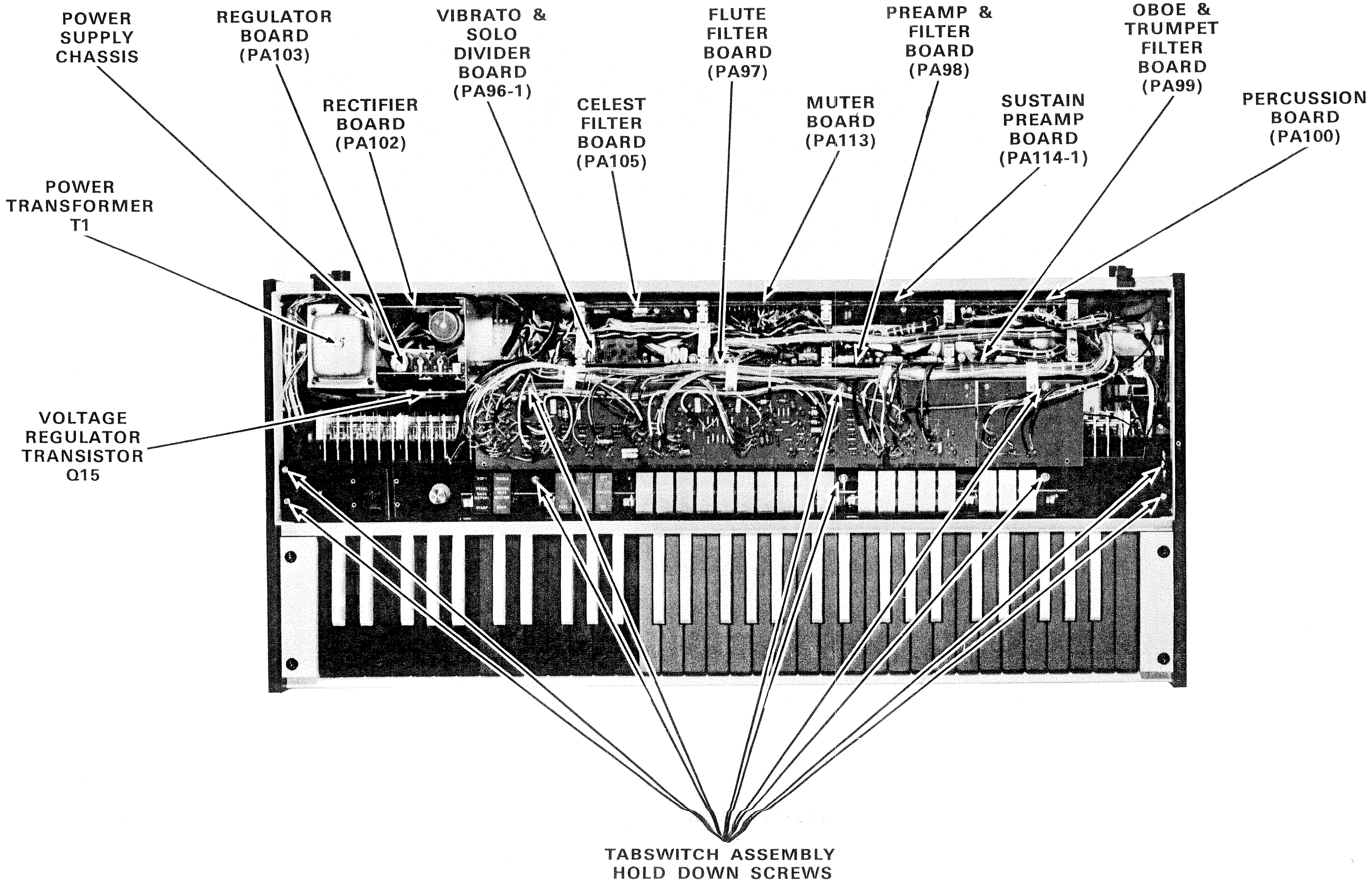
FRONT VIEW
FAST 4 & 5


TOP COVER MOUNTING SCREWS (4)
SUSTAIN TABS (FAST 5 ONLY)
FARFISA
MANUAL BASS KEYS C1-B1
EXTENDED BASS KEYS C2-B2
TREBLE KEYS C3-C6
KEYBOARD COVER
13 BASS PEDALS C1-C2 (OPTIONAL)
SWELL PEDAL

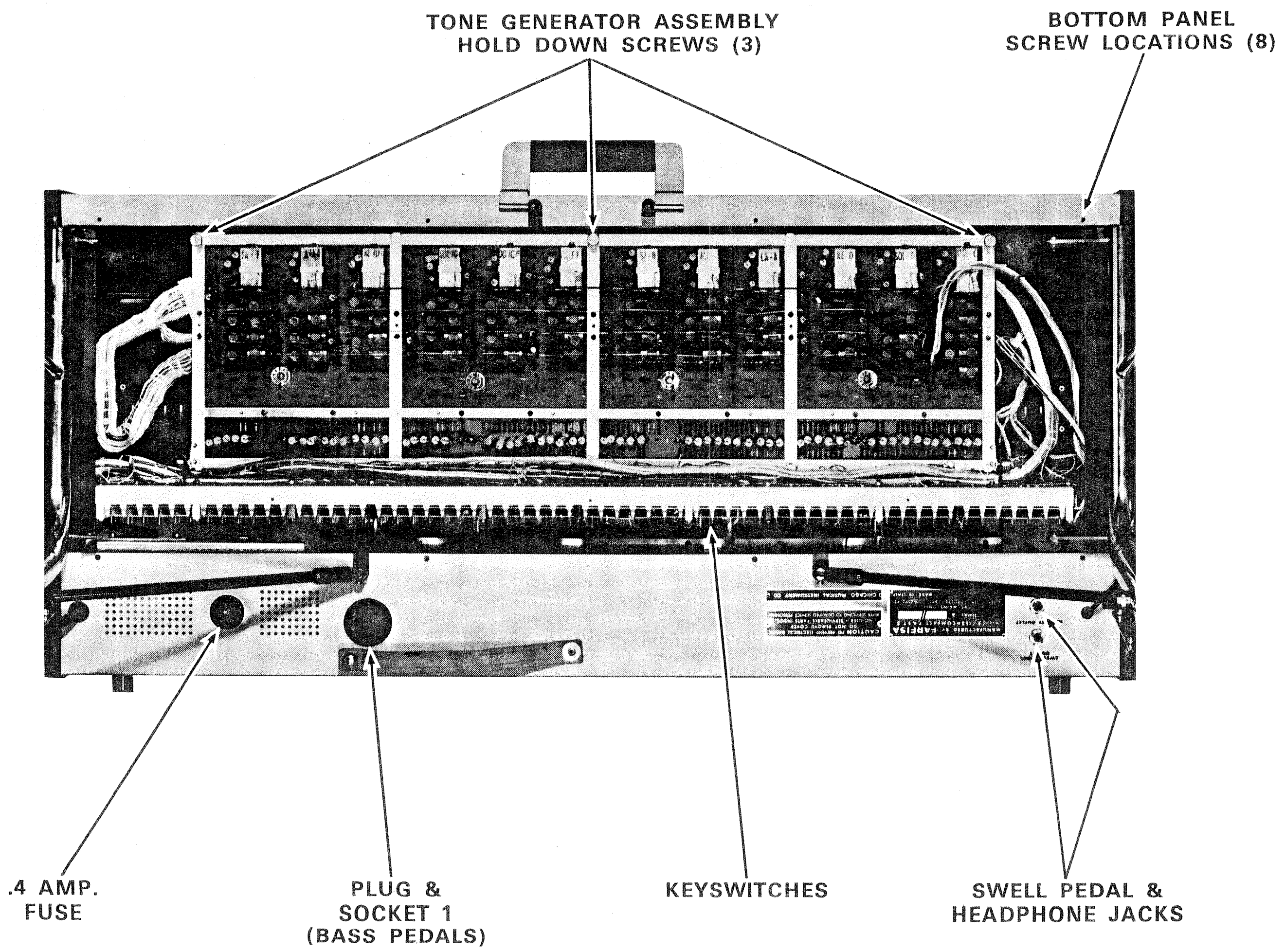
TOP VIEW
FAST 4
(With Cover Removed)


RECTIFIER BOARD (PA102)
REGULATOR BOARD (PA103)
FLUTE FILTER BOARD (PA97)
VIBRATO & SOLO DIVIDER BOARD (PA96)
PREAMP & FILTER BOARD (PA98)
VOLTAGE FILTER BOARD (PA101)
OBOE & TRUMPET FILTER BOARD (PA99)
PERCUSSION BOARD (PA100)
POWER SUPPLY CHASSIS
POWER TRANSFORMER T1
VOLTAGE REGULATOR TRANSISTOR Q16
9 TABSWITCH ASSEMBLY HOLD DOWN SCREWS

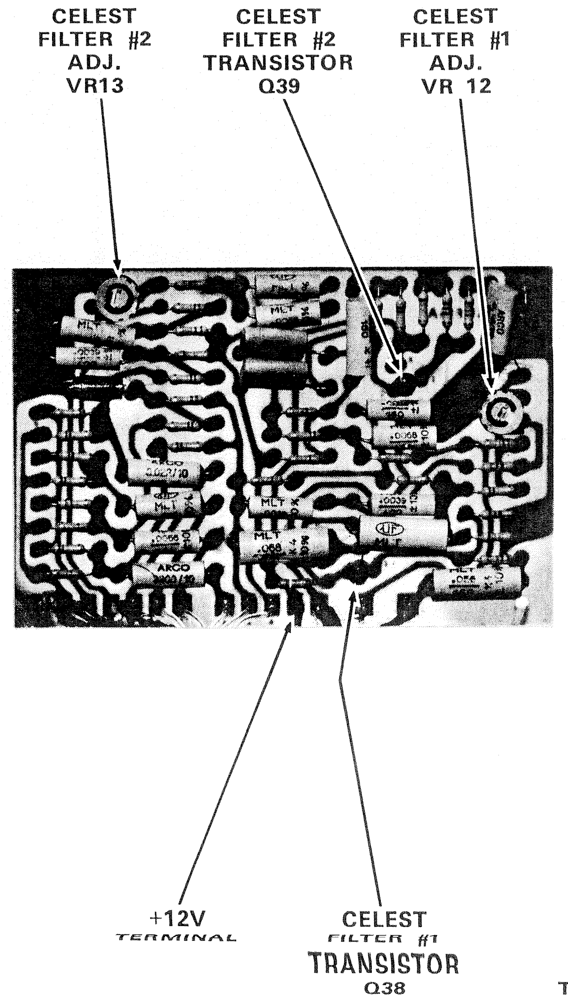
TOP VIEW
FAST 5
(With Cover Removed)


POWER SUPPLY CHASSIS
REGULATOR BOARD (PA103)
RECTIFIER BOARD (PA102)
VIBRATO & SOLO DIVIDER BOARD (PA96-1)
CELEST FILTER BOARD (PA105)
FLUTE FILTER BOARD (PA97)
MUTER BOARD (PA113)
PREAMP & FILTER BOARD (PA98)
SUSTAIN PREAMP BOARD (PA114-1)
OBOE & TRUMPET FILTER BOARD (PA99)
PERCUSSION BOARD (PA100)
POWER TRANSFORMER T1
VOLTAGE REGULATOR TRANSISTOR Q15
TABSWITCH ASSEMBLY HOLD DOWN SCREWS

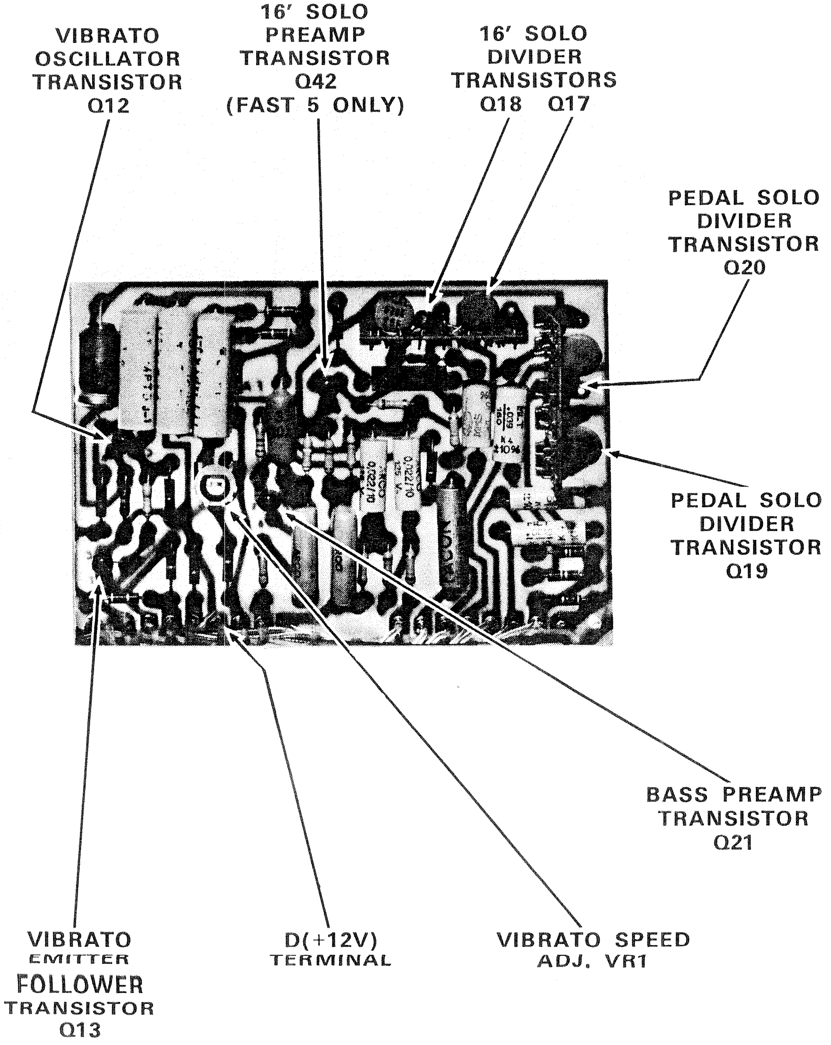
BOTTOM VIEW
FAST 4 & 5
(With Bottom Panel Removed)
(Fast 5 Shown)


TONE GENERATOR ASSEMBLY
HOLD DOWN SCREWS (3)
BOTTOM PANEL
SCREW LOCATIONS (8)
.4 AMP.
FUSE
PLUG &
SOCKET 1
(BASS PEDALS)
KEYSWITCHES
SWELL PEDAL &
HEADPHONE JACKS

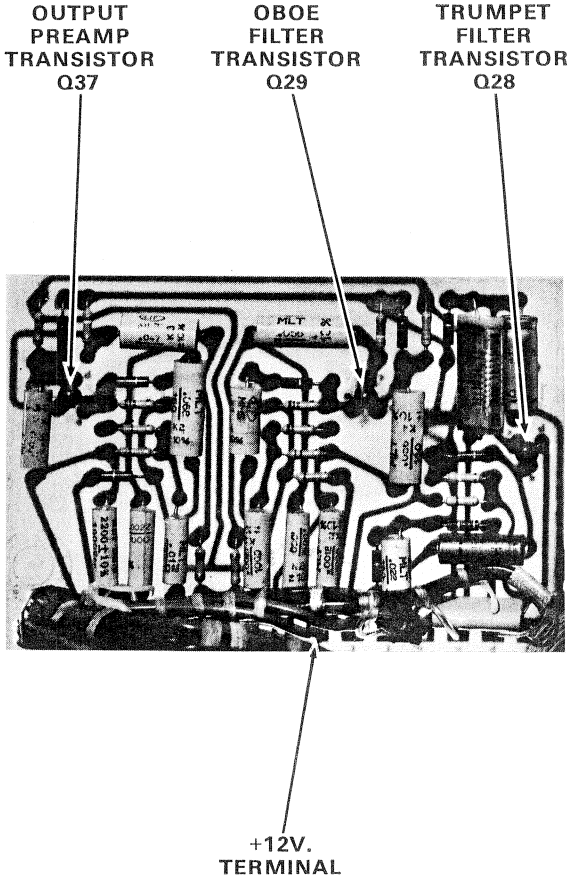
CELEST FILTER BOARD
(PA-105 FAST 5 ONLY)


CELEST FILTER #2 ADJ. VR13
CELEST FILTER #2 TRANSISTOR Q39
CELEST FILTER #1 ADJ. VR 12
+12V TERMINAL
CELEST FILTER #1 TRANSISTOR Q38

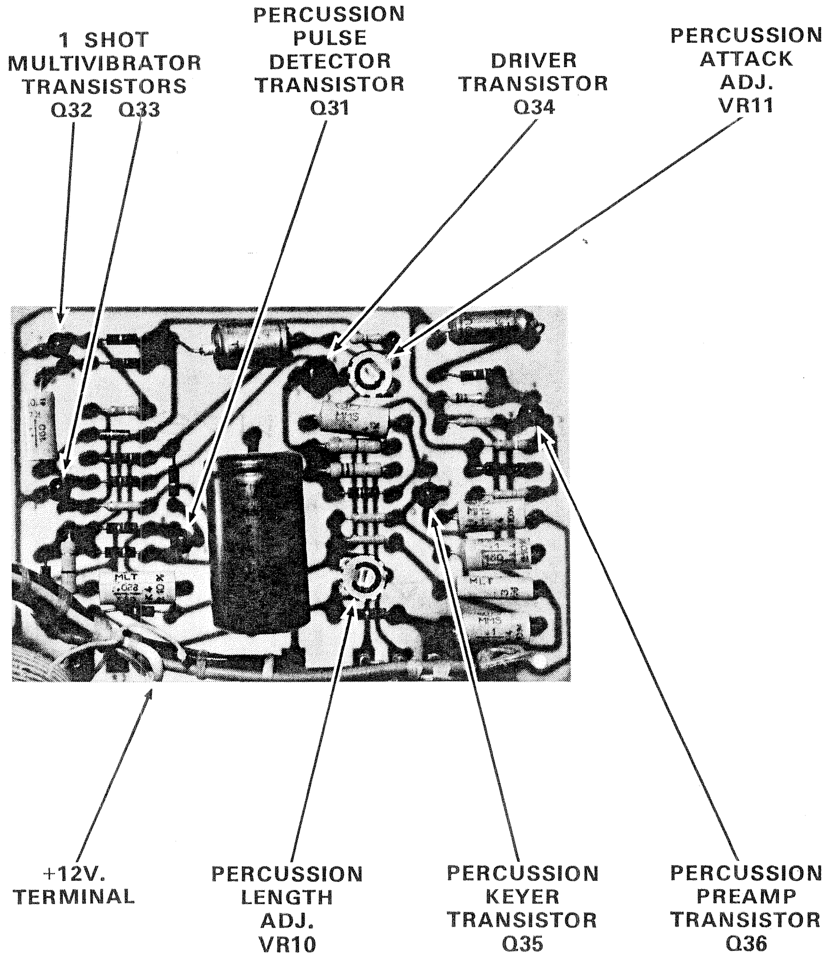
VIBRATO & SOLO BOARD
(PA96 FAST 4) (PA96-1 FAST 5)


VIBRATO OSCILLATOR TRANSISTOR Q12
16′ SOLO PREAMP TRANSISTOR Q42 (FAST 5 ONLY)
16′ SOLO DIVIDER TRANSISTORS Q18 Q17
PEDAL SOLO DIVIDER TRANSISTOR Q20
PEDAL SOLO DIVIDER TRANSISTOR Q19
BASS PREAMP TRANSISTOR Q21
VIBRATO EMITTER FOLLOWER TRANSISTOR Q13
D(+12V) TERMINAL
VIBRATO SPEED ADJ. VR1

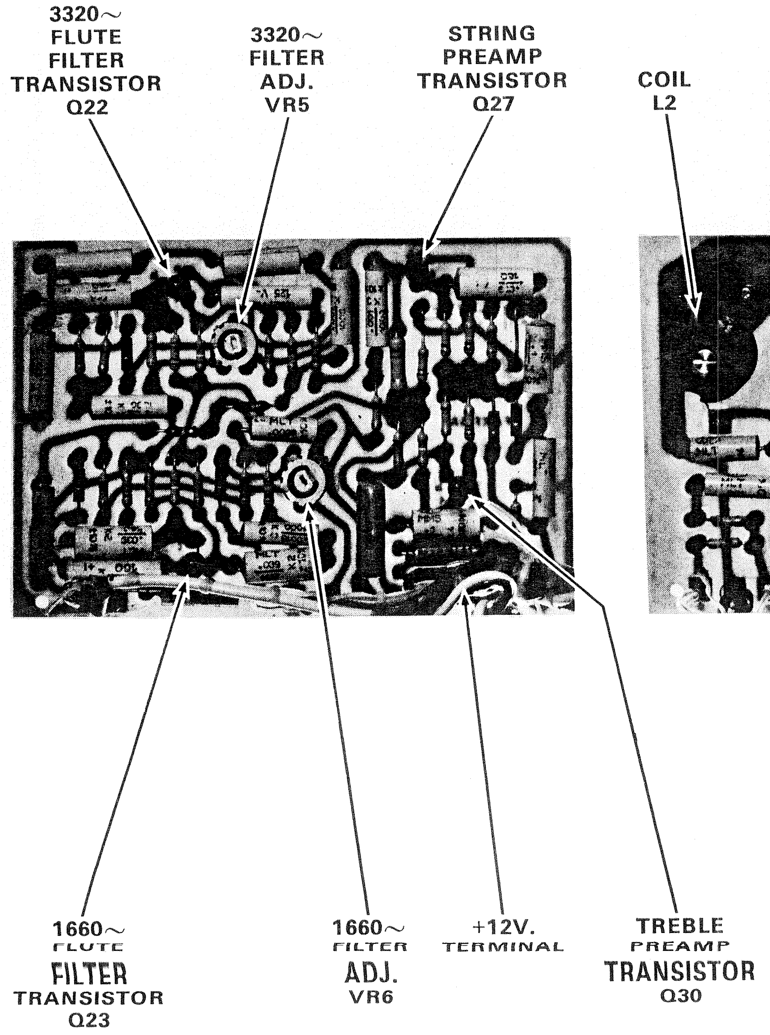
OBOE & TRUMPET FILTER BOARD
(FAST 4 & 5 PA99)


OUTPUT PREAMP TRANSISTOR Q37
OBOE FILTER TRANSISTOR Q29
TRUMPET FILTER TRANSISTOR Q28
+12V. TERMINAL

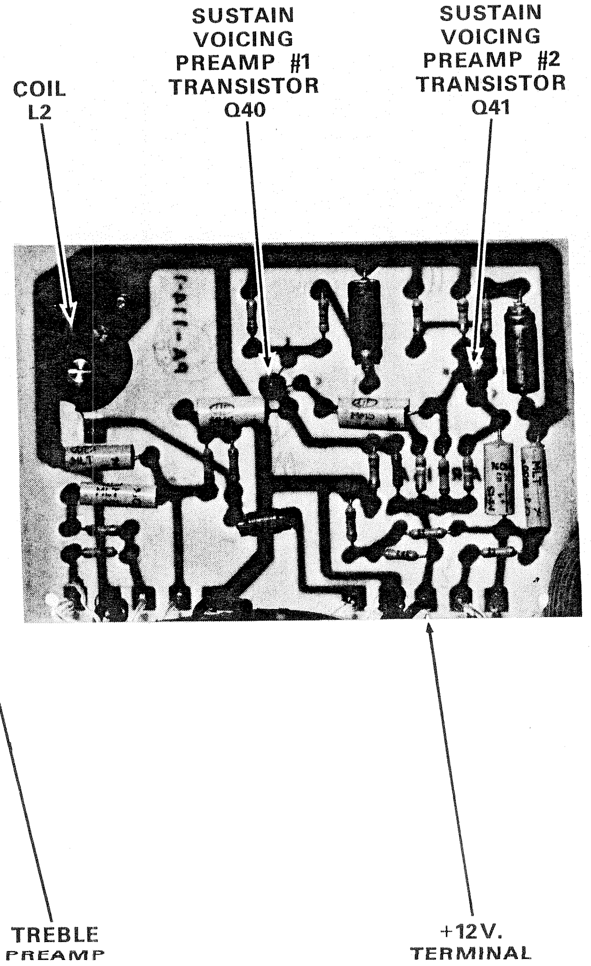
PERCUSSION BOARD
(FAST 4 & 5 PA100)


1 SHOT MULTIVIBRATOR TRANSISTORS Q32 Q33
PERCUSSION PULSE DETECTOR TRANSISTOR Q31
DRIVER TRANSISTOR Q34
PERCUSSION ATTACK ADJ. VR11
+12V. TERMINAL
PERCUSSION LENGTH ADJ. VR10
PERCUSSION KEYER TRANSISTOR Q35
PERCUSSION PREAMP TRANSISTOR Q36

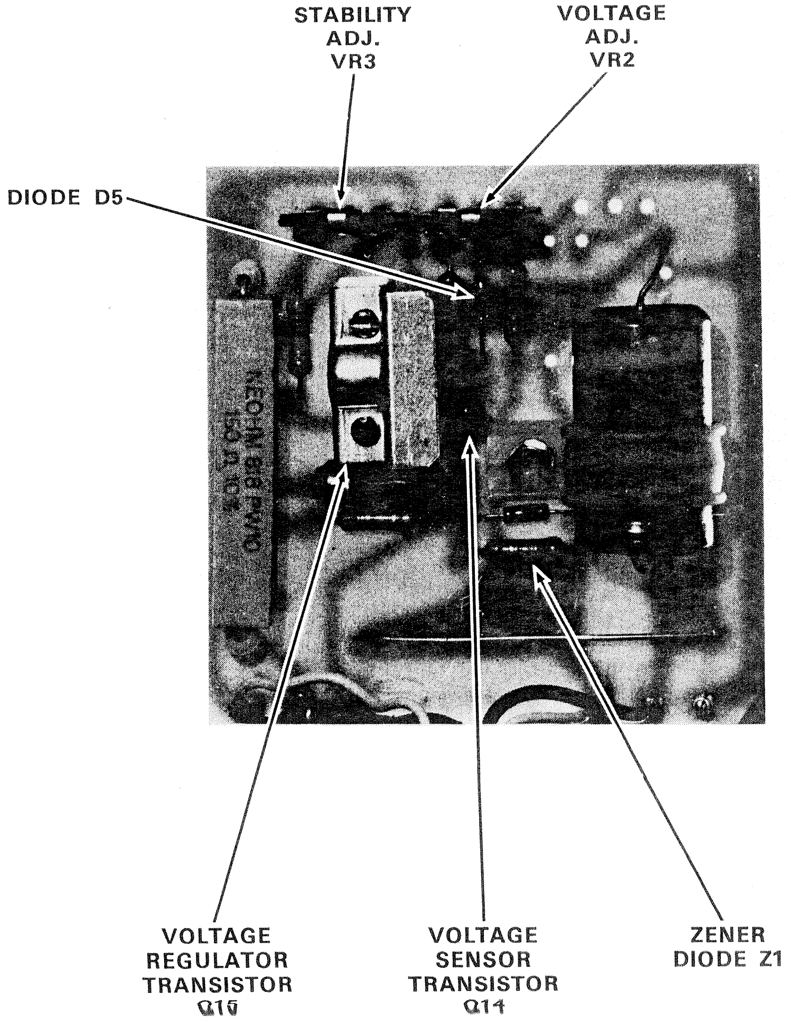
PREAMP & FILTER BOARD
(FAST 4 & 5 PA98)


3320~ FLUTE FILTER TRANSISTOR Q22
3320~ FILTER ADJ. VR5
STRING PREAMP TRANSISTOR Q27
1660~ FLUTE FILTER TRANSISTOR Q23
1660~ FILTER ADJ. VR6
+12V. TERMINAL
TREBLE PREAMP TRANSISTOR Q30

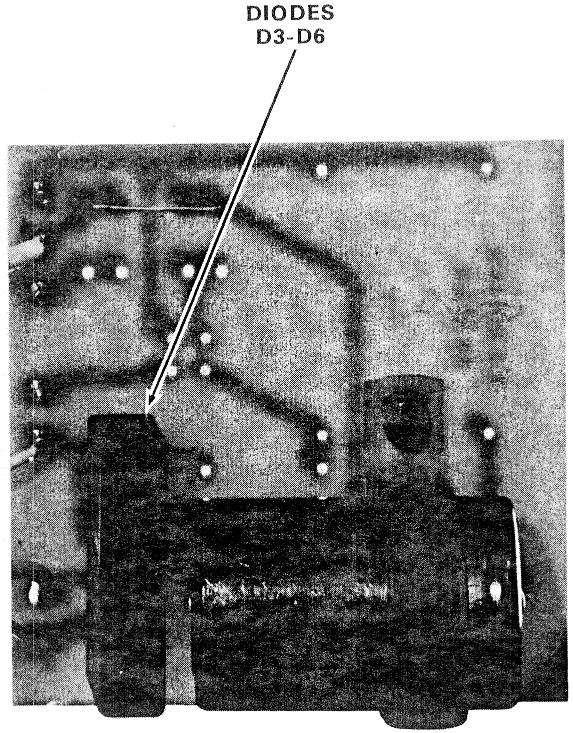
SUSTAIN PREAMP BOARD
(PA114-1 FAST 5 ONLY)


COIL L2
SUSTAIN VOICING PREAMP #1 TRANSISTOR Q40
SUSTAIN VOICING PREAMP #2 TRANSISTOR Q41
+12V. TERMINAL
PA-114-1

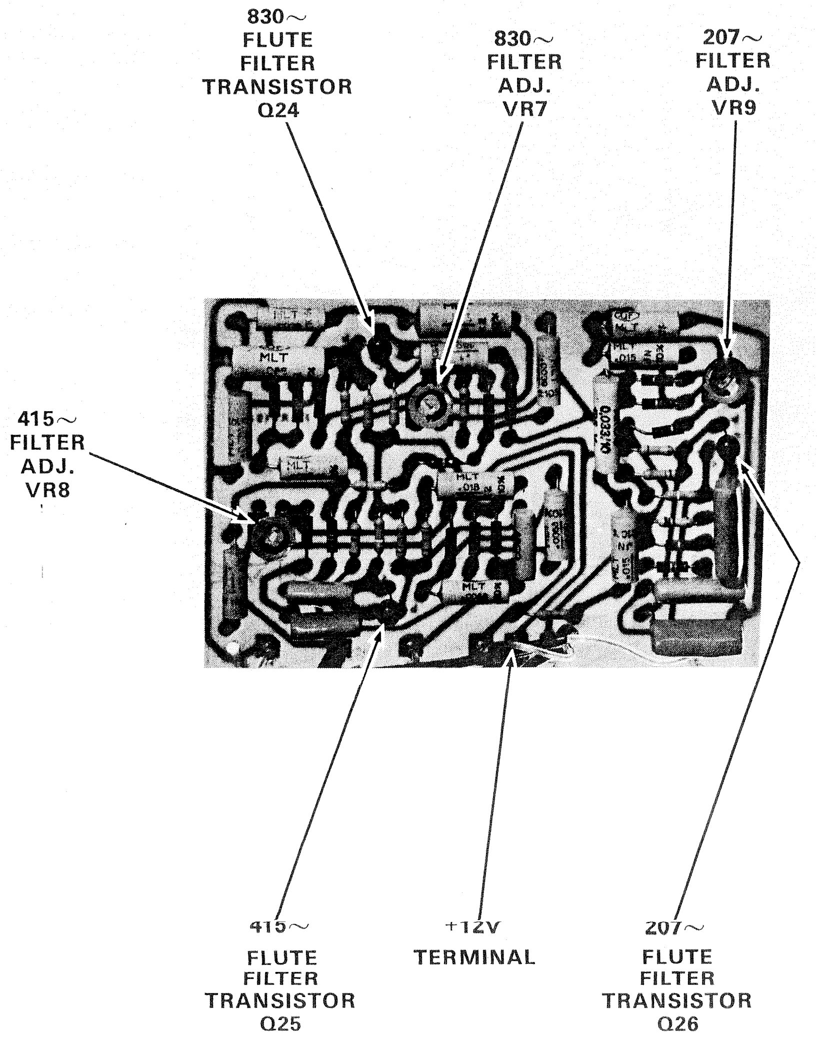
REGULATOR BOARD
FAST 4 & 5
(PA103)


STABILITY ADJ. VR3
VOLTAGE ADJ. VR2
DIODE D5
VOLTAGE REGULATOR TRANSISTOR Q15
VOLTAGE SENSOR TRANSISTOR Q14
ZENER DIODE Z1
KEOHM 818 PW10 150 Ω 10%

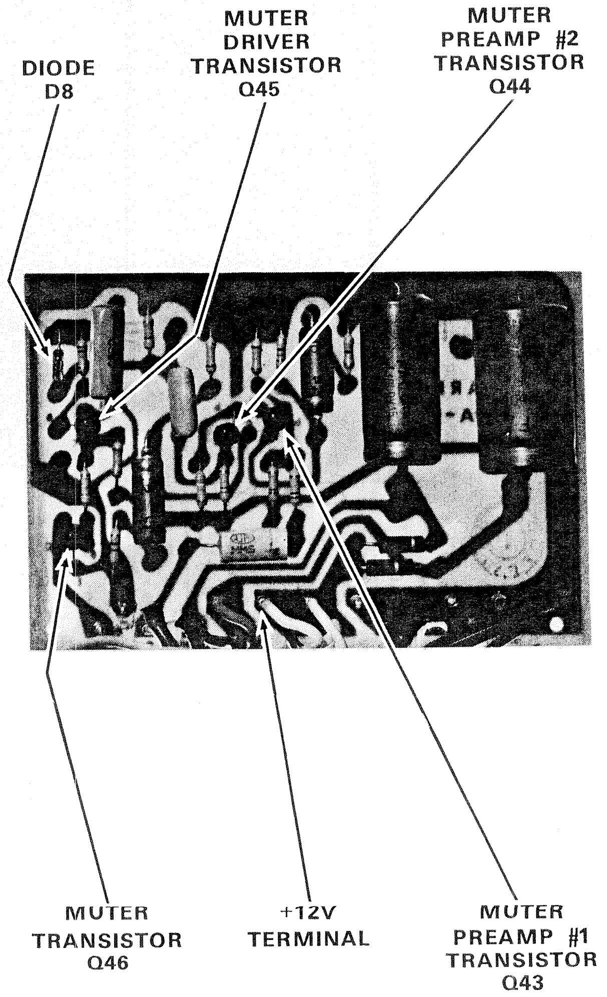
RECTIFIER BOARD
FAST 4 & 5
(PA102)


DIODES D3-D6

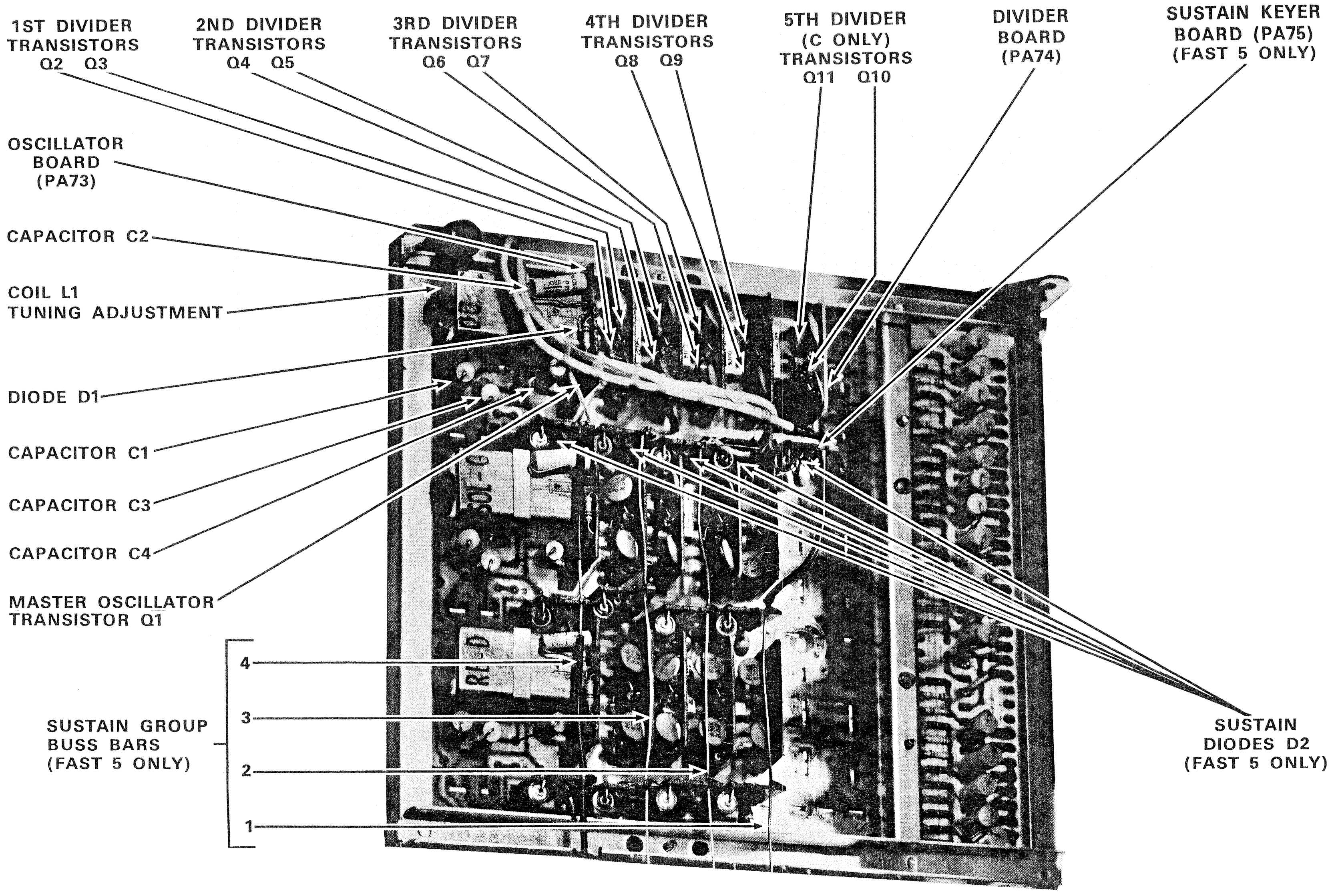
FLUTE FILTER BOARD
FAST 4 & 5
(PA97)


830~ FLUTE FILTER TRANSISTOR Q24
830~ FILTER ADJ. VR7
207~ FILTER ADJ. VR9
415~ FILTER ADJ. VR8
415~ FLUTE FILTER TRANSISTOR Q25
+12V TERMINAL
207~ FLUTE FILTER TRANSISTOR Q26

MUTER BOARD
(PA-113 FAST 5 ONLY)


DIODE D8
MUTER DRIVER TRANSISTOR Q45
MUTER PREAMP #2 TRANSISTOR Q44
MUTER TRANSISTOR Q46
+12V TERMINAL
MUTER PREAMP #1 TRANSISTOR Q43

TONE GENERATOR BOARD
(With Oscillator, Divider & Sustain Keyer Boards)
FAST 4 & 5 (PA76)


1ST DIVIDER TRANSISTORS Q2 Q3
2ND DIVIDER TRANSISTORS Q4 Q5
3RD DIVIDER TRANSISTORS Q6 Q7
4TH DIVIDER TRANSISTORS Q8 Q9
5TH DIVIDER (C ONLY) TRANSISTORS Q11 Q10
DIVIDER BOARD (PA74)
SUSTAIN KEYER BOARD (PA75) (FAST 5 ONLY)
OSCILLATOR BOARD (PA73)
CAPACITOR C2
COIL L1 TUNING ADJUSTMENT
DIODE D1
CAPACITOR C1
CAPACITOR C3
CAPACITOR C4
MASTER OSCILLATOR TRANSISTOR Q1
4
3
2
1
SUSTAIN GROUP BUSS BARS (FAST 5 ONLY)
SUSTAIN DIODES D2 (FAST 5 ONLY)

PROFESSIONAL

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SPECIFICATIONS

MAIN FEATURES
61 Notes Keyboard—C to C
Phonic extension: 32.7 cycles to 7,902 cycles

Swell Pedal

Flute Section
8 Voice Stops: 16′ - 8′ - 5-1/3′
4′ - 2-2/3′ - 2′ - 1-3/5′ - 1-1/3′
Cancel Tab
Independent Volume Control
Independent Vibrato Control

Clarinet-Sharp Section
4 Clarinet Voice Stops: 16′ - 8′ - 5-1/3′ - 4′
4 Sharp Voice Stops: 2-2/3′ - 2′ - 1-3/5′ - 1-1/3′
Cancel Tab
Independent Volume Control
Independent Vibrato Control

Percussion Section
8 Stops: 16′ - 8′ - 5-1/3′ - 4′ - 2-2/3′ - 2′ - 1-3/5′ - 1-1/3′
Percussion length control: Short - Medium - Long
Cancel Tab operating on the 3 lowest octaves
Cancel Tab operating on the 2 highest octaves
2-position tab for Percussion with synchronized repetition or for Percussion according to the Phrasing.
Independent Volume Control

Sustain Section
3 Stops: Celesta - Harpsichord - Kinura
2-position Sustain length control tab
Cancel Tab operating on the 3 lowest octaves
Independent Volume Control
Independent Vibrato Control

Vibrato Section
3 Stops: On/Off - Slow/Fast - Light/Heavy

Overall Output Volume Control

Output for Stereo Headset

Tilting Keyboard

On/Off switch and Pilot lamp
Folding legs
Elegant carrying bag
Voltage: 115 Volt AC, 60 cycles
Dimensions when in use: 38″ x 18¾″ x 36″
Dimensions of the instrument closed:
40″ x 10″ x 20″
Weight: 67 lbs.

ADJUSTMENTS PROFESSIONAL

VR1-VR11 FILTERS
These adjustments are carefully set at the factory! Readjustment should not be necessary unless Filter components are replaced. To adjust a filter: First, connect an A.C. voltmeter across the speakers in the amplifier to which the organ is connected. Then, with a clip lead, ground the transistor collector lead of the filter requiring adjustment. While the filter is grounded and using only one flute tabswitch at a time, locate a group of dead keys on the keyboard and hold down one key at or near the center of this group. Next, while holding the note, remove the clip lead from the filter transistor. Now with the note playing, adjust the A.C. meter range so that the meter needle reads near center scale. (Use any meter range and organ volume combination that is convenient). With the note still playing, set the filter adjustment to a point that gives the maximum increase in A.C. voltage.

VR12-VR13 VIBRATO DEPTH & LEVEL
These two adjustments affect each other. Adjustment of one will change the other. Proper adjustment is achieved when the vibrato functions clearly. Extreme setting of either the depth or level adjustments will result in **no vibrato.** Always try adjusting vibrato before servicing the vibrato circuits.

VR14-VR15 PERCUSSION LENGTH & ATTACK
These two adjustments affect each other. Adjustment of one will change the other. Proper adjustment is achieved when the percussion functions with the least amount of key pop; and with a distinct difference in percussion length between short and long percussion tabswitch settings. Extreme setting of either the length or attack adjustments will result in **no percussion.** Always try adjusting percussion before servicing the percussion circuits.

VR16 SQUELCH
The function of this adjustment is to compensate for tolerences in Squelch Keyer transistors. Since this adjustment is carefully set at the factory, adjustment should only be necessary when squelch circuit components are replaced. Proper setting is achieved when this adjustment is at or near center and the organ plays with ample volume range.

VR17 ORGAN LEVEL
Set this adjustment according to customer preference! A normal setting is approximately three-fourths toward full volume.

VR22 +12 VOLTAGE
This adjustment is carefully set at the factory! Readjustment should not be necessary unless Power Supply components are replaced. To adjust, connect a D.C. voltmeter to plug and socket #1 pin 3, then set the adjustment so that the meter reads +12 volts. Improper voltage adjustment will result in unstable tone generator operation. Always check the +12 volt supply voltage before servicing tone generators.

VR23 STABILITY
The stability adjustment is carefully set at the factory! Readjustment should not be necessary unless Power Supply components are replaced. This adjustment has a wide range of normal operation. Only extreme settings on this adjustment will result in unstable Power Supply operation.

VR24 +6 VOLTAGE
This adjustment is carefully set at the factory! Readjustment should not be necessary unless Power Supply components are replaced. To adjust, connect a D.C. voltmeter to plug and socket #1 pin 5, then set the adjustment so that the meter reads + 6 volts. +6V is used for audio ground. Low or missing +6V will result in hum and increased sound leakage. Always check the +6 volt supply voltage before servicing.

L1 TUNING
The 12 Tone Generator Master Oscillator circuits determine the pitch of the entire organ. Adjusting any one of the Master Oscillator tuning adjustments will tune all the notes of that tone generator. Tuning any group of 12 notes automatically tunes the entire organ.

Tuning may be accomplished by using a small non-conductive screwdriver and one of the following methods:

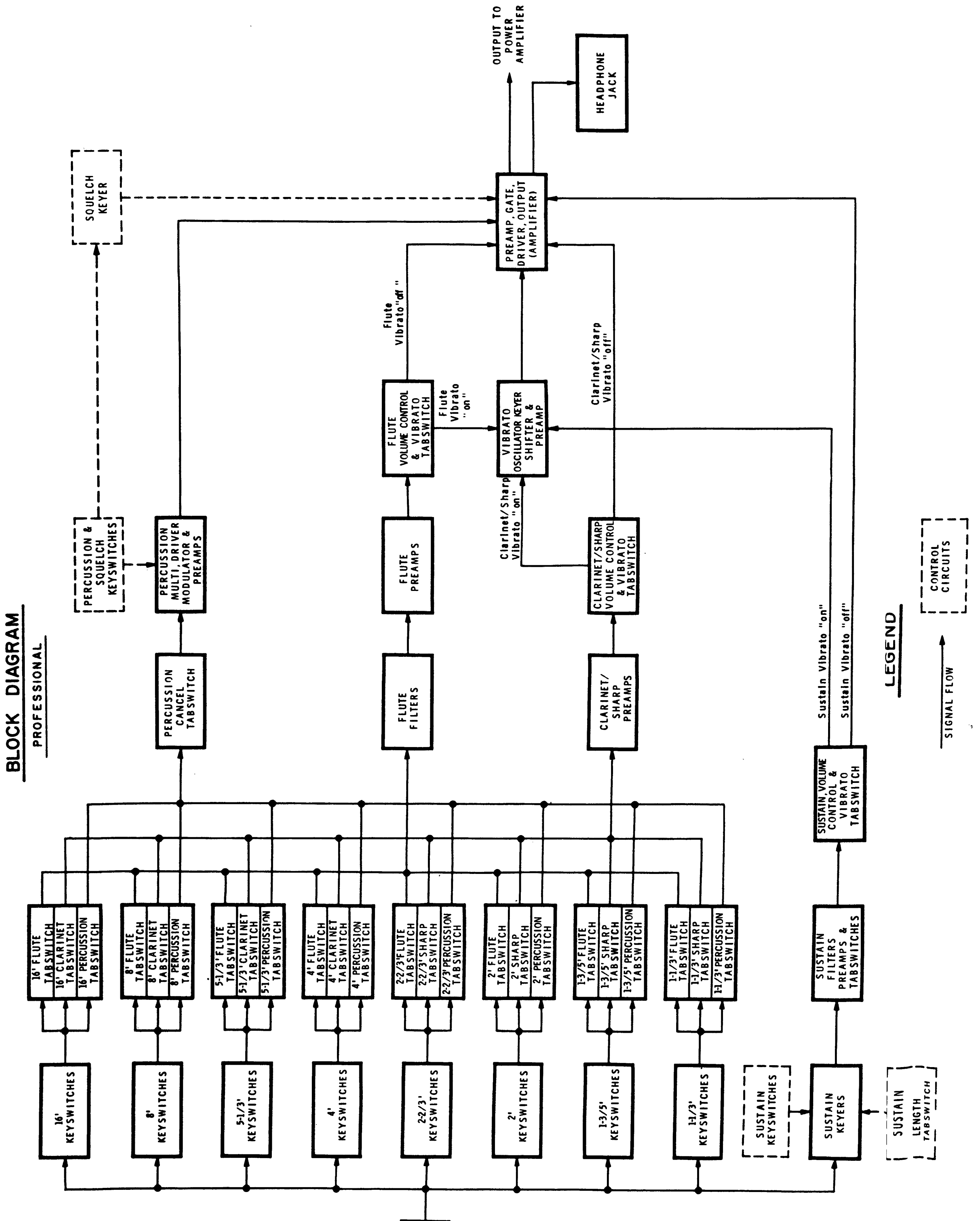
1. Set of 12 Tuning Forks: Zero beat the note of the organ to be tuned to the sound of the corresponding tuning fork. This is a highly accurate method for tuning.
2. Strobo Conn or Strobo Tuner: This is done by visual observation of a strob pattern. Simply follow directions supplied with the Strobotuner. This is a highly accurate tuning method.
3. Another instrument: Zero beat the note of the organ to be tuned to the sound of a corresponding note on an "in tune" instrument (piano, organ, accordion, etc.). Accuracy is dependent upon the tuning of the other instruments. This method is especially desirable when the other instrument is to be played with the organ.
4. One Tuning Fork: One tuning fork is used to set the "temperment" (one note). The other 11 notes are set by ear using the number of beats between "4ths" and "5ths." This requires a trained ear. Accuracy is dependent upon the tuner.

PROFESSIONAL

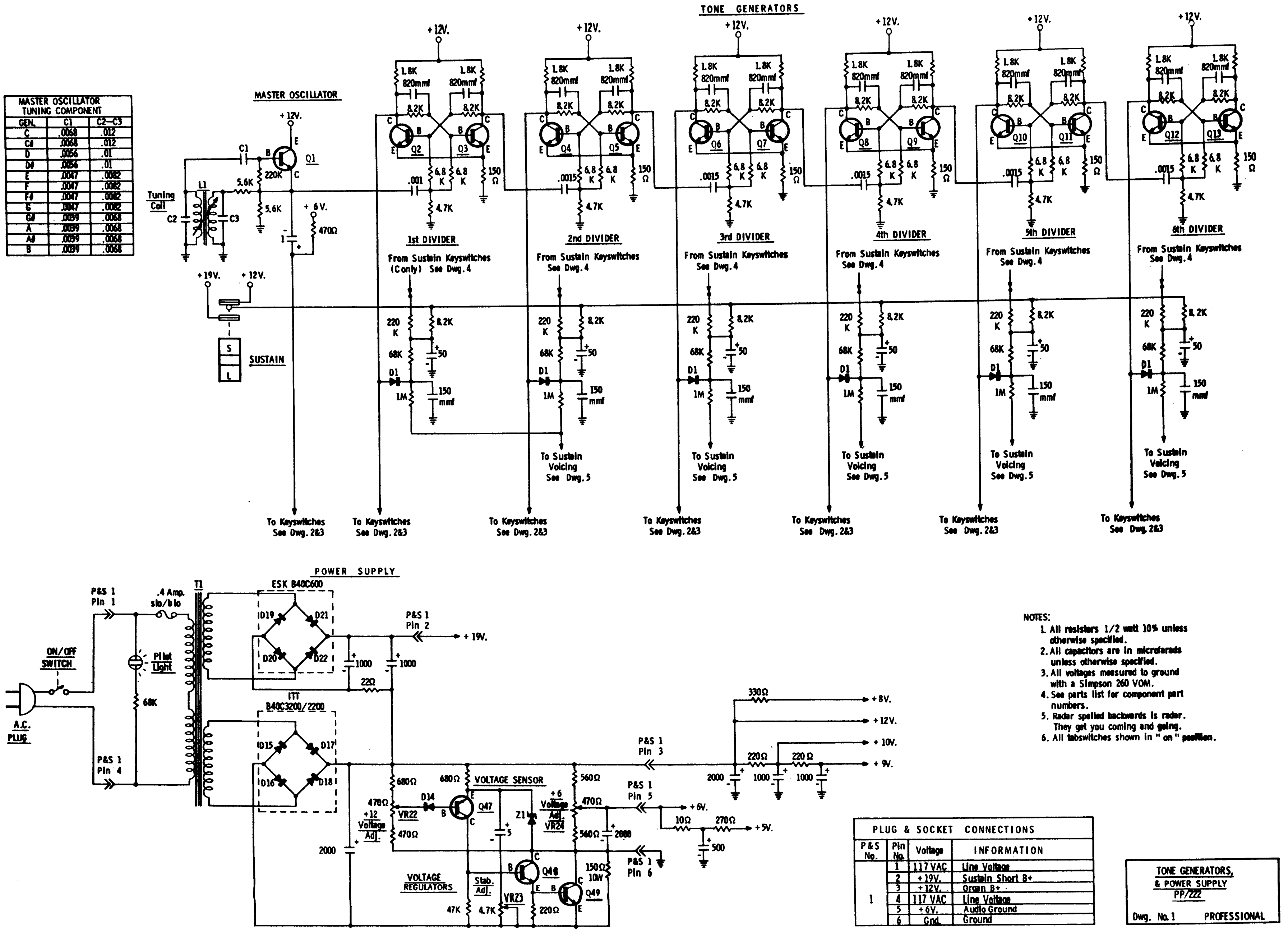
TRANSISTOR VOLTAGES

Q No.	Circuit	Collector or Drain	Emitter or Source	Base or Gate
Q1	Master Oscillator	+2.2	+12	+14
Q2-Q3	1st Divider	+6	+1.3	+1.5
Q4-Q5	2nd Divider	+6	+1.3	+1.5
Q6-Q7	3rd Divider	+6	+1.3	+1.5
Q8-Q9	4th Divider	+6	+1.3	+1.5
Q10-Q11	5th Divider	+6	+1.3	+1.5
Q12-Q13	6th Divider	+6	+1.3	+1.5
Q14	16′ Solo Divider	+10	+1.1	+1
Q15	16′ Solo Divider	+1.3	+1.1	+1.8
Q16	Clarinet/Sharp Preamp	+3.8	+.7	+.4
Q17	Clarinet/Sharp Preamp	+4.5	+3.1	+3.8
Q18	103⁀Flute Filter	+4.9	+.7	+1
Q19	206⁀Flute Filter	+4.9	+.7	+1
Q20	412⁀Flute Filter	+4.9	+.7	+1
Q21	824⁀Flute Filter	+4.9	+.7	+1
Q22	1648⁀Flute Filter	+4.9	+.7	+1
Q23	3296⁀Flute Filter	+4.9	+.7	+1
Q24	6592⁀Flute Filter	+5.4	+.7	+.6
Q25	Flute Preamp	+3.5	+.9	+1
Q26	206⁀Celeste Filter	+5.5	+.5	+.5
Q27	412⁀Celeste Filter	+5	+.5	+.5
Q28	824⁀Celeste Filter	+5.2	+.5	+.5
Q29	1648⁀Celeste Filter	+5.5	+.5	+.5
Q30	Celeste/Kinura Preamp	+4.9	+.6	+.9
Q31	Percussion Multivibrator	+.3	0	+.7
Q32	Percussion Multivibrator	+12	0	0
Q33	Percussion Driver	0	+9	+12
Q34	Percussion Modulator	+9	0	+9
Q35	Percussion Preamp	+3.5	+.5	+.4
Q36	Percussion Preamp	+6	+3	+3.5
Q37	Vibrato Oscillator	+5	+1.7	+1.5
Q38	Vibrato Phase Shifter	+9	+.5	+.7
Q39	Vibrato Phase Keyer	+9	+9	+2.8
Q40	Vibrato Output Preamp	+5		+.3
Q41	Squelch Keyer	0	+11	+8.8
Q42	Amp Input Preamp	+7	+1	+1.2
Q43	Squelch Gate	+1.3	+4	+1.5
Q44	Driver	+4.2	+.7	+1.3
Q45	Output	0	+5	+4.2
Q46	Output	+12	+5.5	+6
Q47	Voltage Sensor	−12	+5.8	+5.2
Q48	Voltage Regulator	0	−12.5	−12.5
Q49	Voltage Regulator	0	+12	+12

PROFESSIONAL


BLOCK DIAGRAM
PROFESSIONAL
TONE GENERATORS
16' KEYSWITCHES
8' KEYSWITCHES
5-1/3' KEYSWITCHES
4' KEYSWITCHES
2-2/3' KEYSWITCHES
2' KEYSWITCHES
1-3/5' KEYSWITCHES
1-1/3' KEYSWITCHES
16' FLUTE TABSWITCH
16' CLARINET TABSWITCH
16' PERCUSSION TABSWITCH
8' FLUTE TABSWITCH
8' CLARINET TABSWITCH
8' PERCUSSION TABSWITCH
5-1/3' FLUTE TABSWITCH
5-1/3' CLARINET TABSWITCH
5-1/3' PERCUSSION TABSWITCH
4' FLUTE TABSWITCH
4' CLARINET TABSWITCH
4' PERCUSSION TABSWITCH
2-2/3' FLUTE TABSWITCH
2-2/3' SHARP TABSWITCH
2-2/3' PERCUSSION TABSWITCH
2' FLUTE TABSWITCH
2' SHARP TABSWITCH
2' PERCUSSION TABSWITCH
1-3/5' FLUTE TABSWITCH
1-3/5' SHARP TABSWITCH
1-3/5' PERCUSSION TABSWITCH
1-1/3' FLUTE TABSWITCH
1-1/3' SHARP TABSWITCH
1-1/3' PERCUSSION TABSWITCH
SUSTAIN KEYSWITCHES
SUSTAIN KEYERS
SUSTAIN LENGTH TABSWITCH
SUSTAIN FILTERS PREAMPS & TABSWITCHES
SUSTAIN VOLUME CONTROL & VIBRATO TABSWITCH
Sustain Vibrato "on"
Sustain Vibrato "off"
PERCUSSION CANCEL TABSWITCH
PERCUSSION & SQUELCH KEYSWITCHES
PERCUSSION MULTI, DRIVER MODULATOR & PREAMPS
SQUELCH KEYER
FLUTE FILTERS
FLUTE PREAMPS
FLUTE VOLUME CONTROL & VIBRATO TABSWITCH
Flute Vibrato "on"
Flute Vibrato "off"
CLARINET/ SHARP PREAMPS
CLARINET/SHARP VOLUME CONTROL & VIBRATO TABSWITCH
Clarinet/Sharp Vibrato "on"
Clarinet/Sharp Vibrato "off"
VIBRATO OSCILLATOR KEYER SHIFTER & PREAMP
PREAMP, GATE, DRIVER, OUTPUT (AMPLIFIER)
OUTPUT TO POWER AMPLIFIER
HEADPHONE JACK
LEGEND
SIGNAL FLOW
CONTROL CIRCUITS

PROFESSIONAL


TONE GENERATORS
MASTER OSCILLATOR
+12V.
Q1
C1
B
E
C
220K
5.6K
5.6K
+6V.
470Ω
1
Tuning Coil
L1
C2
C3
+19V.
+12V.
SUSTAIN
S
L
1.8K
820mmf
8.2K
Q2
Q3
Q4
Q5
Q6
Q7
Q8
Q9
Q10
Q11
Q12
Q13
6.8 K
150 Ω
.001
.0015
4.7K
1st DIVIDER
2nd DIVIDER
3rd DIVIDER
4th DIVIDER
5th DIVIDER
6th DIVIDER
From Sustain Keyswitches (C only) See Dwg.4
From Sustain Keyswitches See Dwg.4
220 K
8.2K
50
68K
D1
1M
150 mmf
To Sustain Voicing See Dwg.5
To Keyswitches See Dwg. 2&3
POWER SUPPLY
P&S 1 Pin 1
.4 Amp. slo/blo
T1
ON/OFF SWITCH
Pilot Light
68K
A.C. PLUG
P&S 1 Pin 4
ESK B40C600
D19
D20
D21
D22
ITT B40C3200/2200
D15
D16
D17
D18
P&S 1 Pin 2
+19V.
1000
1000
22Ω
2000
470Ω
+12 Voltage Adj.
VR22
470Ω
680Ω
680Ω
D14
Q47
VOLTAGE SENSOR
+6 Voltage Adj.
VR24
Z1
5
Q48
Q49
150Ω 10W
VR23
Stab. Adj.
VOLTAGE REGULATORS
47K
4.7K
220Ω
560Ω
470Ω
560Ω
2000
P&S 1 Pin 3
P&S 1 Pin 5
P&S 1 Pin 6
330Ω
+8V.
+12V.
+10V.
+9V.
220Ω
220Ω
1000
1000
2000
+6V.
10Ω
270Ω
+5V.
500

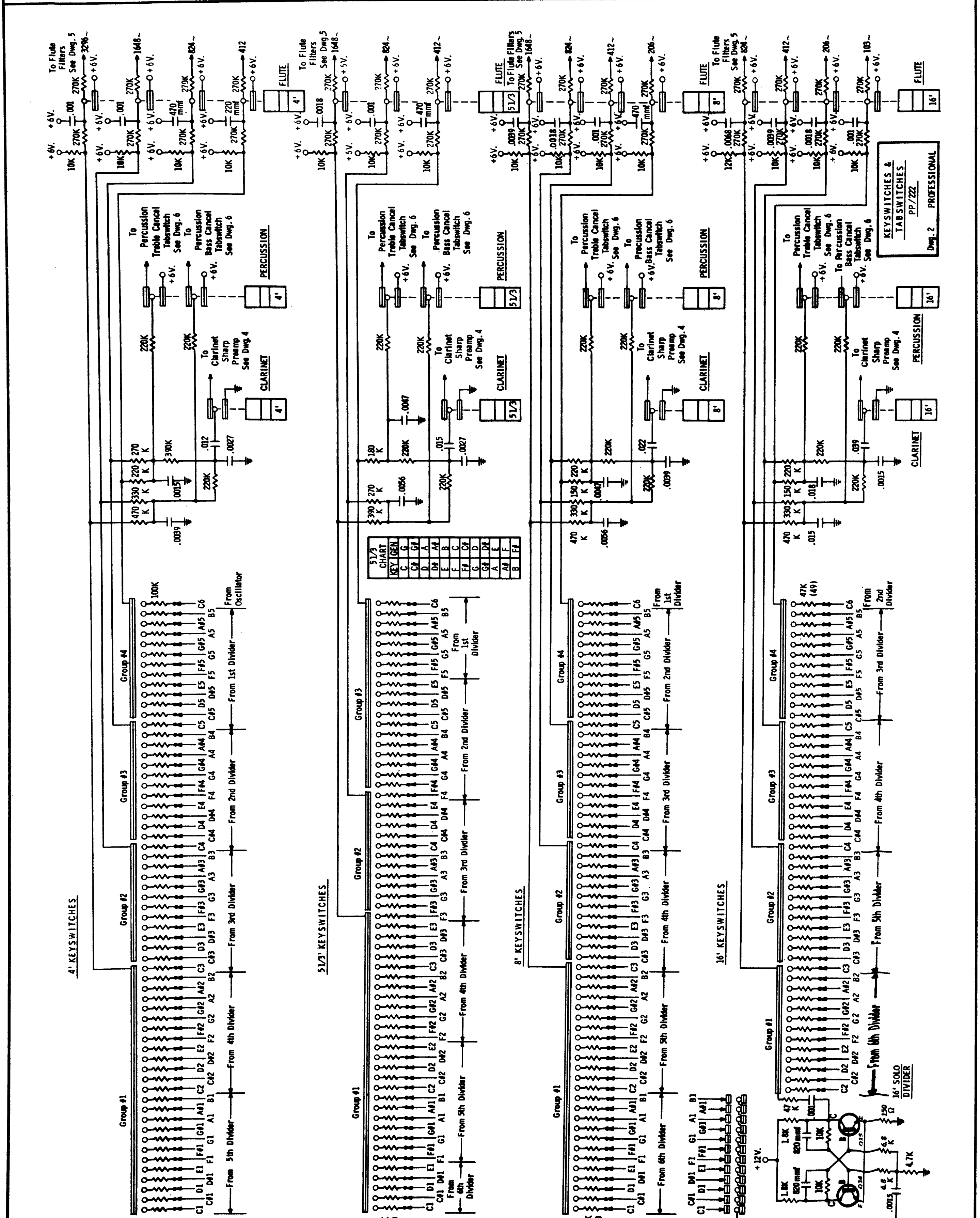
MASTER OSCILLATOR TUNING COMPONENT		
GEN.	C1	C2—C3
C	.0068	.012
C#	.0068	.012
D	.0056	.01
D#	.0056	.01
E	.0047	.0082
F	.0047	.0082
F#	.0047	.0082
G	.0047	.0082
G#	.0039	.0068
A	.0039	.0068
A#	.0039	.0068
B	.0039	.0068

NOTES:
1. All resistors 1/2 watt 10% unless otherwise specified.
2. All capacitors are in microfarads unless otherwise specified.
3. All voltages measured to ground with a Simpson 260 VOM.
4. See parts list for component part numbers.
5. Radar spelled backwards is radar. They get you coming and going.
6. All tabswitches shown in " on " position.

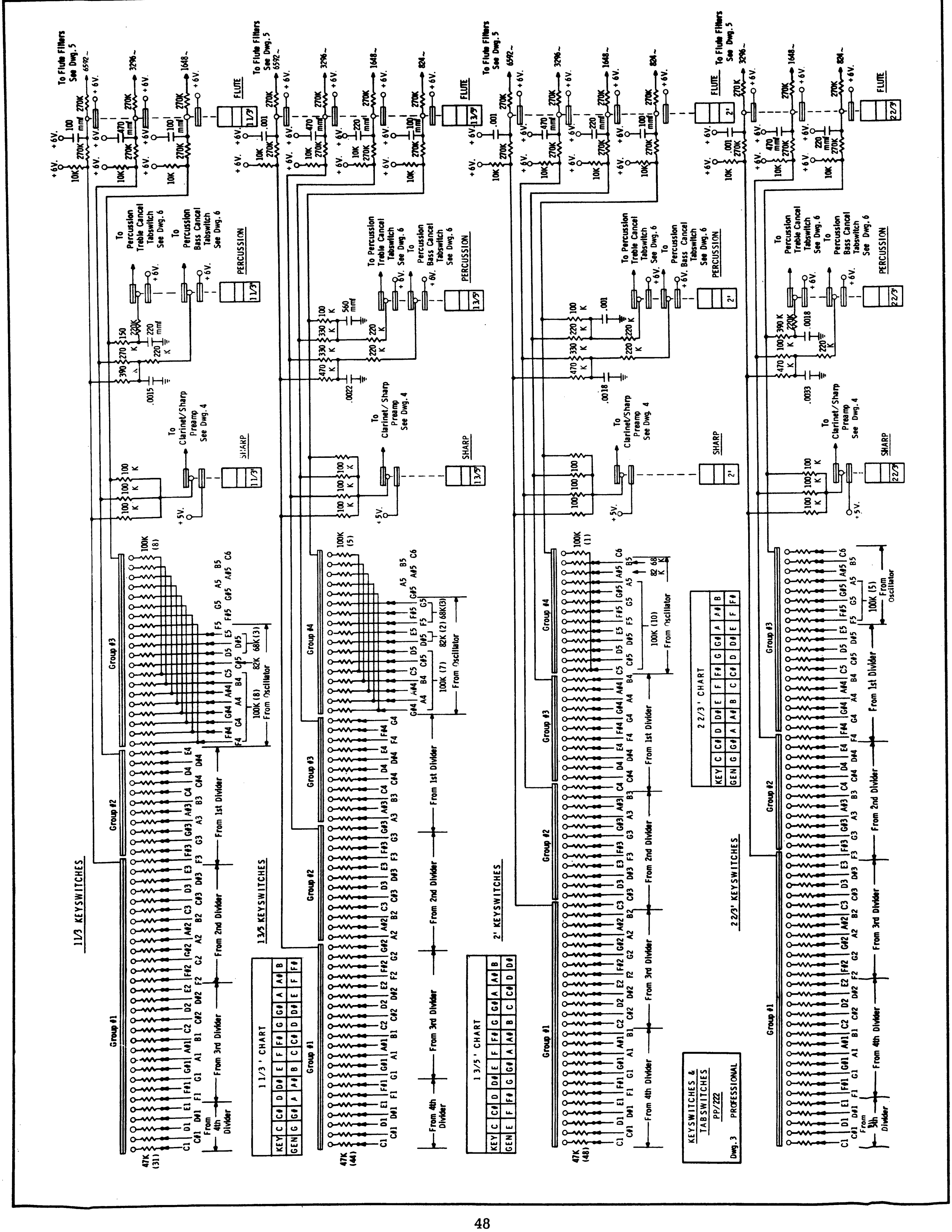
PLUG & SOCKET CONNECTIONS			
P&S No.	Pin No.	Voltage	INFORMATION
1	1	117 VAC	Line Voltage
	2	+19V.	Sustain Short B+
	3	+12V.	Organ B+
	4	117 VAC	Line Voltage
	5	+6V.	Audio Ground
	6	Gnd.	Ground

TONE GENERATORS,
& POWER SUPPLY
PP/222

Dwg. No. 1 PROFESSIONAL


4' KEYSWITCHES
5 1/3' KEYSWITCHES
8' KEYSWITCHES
16' KEYSWITCHES
Group #1
Group #2
Group #3
Group #4
From Oscillator
From 1st Divider
From 2nd Divider
From 3rd Divider
From 4th Divider
From 5th Divider
From 6th Divider
16' SOLO DIVIDER
FLUTE
PERCUSSION
CLARINET
4'
5 1/3
8'
16'
To Flute Filters See Dwg. 5
To Percussion Treble Cancel Tabswitch See Dwg. 6
To Percussion Bass Cancel Tabswitch See Dwg. 6
To Clarinet Sharp Preamp See Dwg. 4
5 1/3 CHART
KEY GEN
C G
C# G#
D A
D# A#
E B
F C
F# C#
G D
G# D#
A E
A# F
B F#
+6V.
+12V.
47K (60)
47K (61)
47K (49)
100K
3296~
1648~
824~
412~
206~
103~
KEYSWITCHES & TABSWITCHES
PP/222
Dwg. 2
PROFESSIONAL

PROFESSIONAL


11/3 KEYSWITCHES
13/5 KEYSWITCHES
2' KEYSWITCHES
22/3' KEYSWITCHES
Group #1
Group #2
Group #3
Group #4
47K (31)
47K (44)
47K (48)
From 4th Divider
From 5th Divider
From 3rd Divider
From 2nd Divider
From 1st Divider
From Oscillator
100K (8)
100K (5)
100K (1)
100K (7)
100K (10)
100K (5)
82K 68K(3)
82K (2) 68K(3)
82 68 K K
FLUTE
PERCUSSION
SHARP
To Flute Filters See Dwg.5
6592~
3296~
1648~
824~
+6V.
+5V.
To Percussion Treble Cancel Tabswitch See Dwg.6
To Percussion Bass Cancel Tabswitch See Dwg.6
To Clarinet/Sharp Preamp See Dwg.4
270K
10K
100 mmf
470 mmf
220 mmf
.001
.0015
.0022
.0018
.0033
.0018
560 mmf
390
270
150
330
470
220 K
100 K
KEYSWITCHES & TABSWITCHES
PP/222
Dwg.3 PROFESSIONAL

1 1/3 ' CHART

KEY	C	C#	D	D#	E	F	F#	G	G#	A	A#	B
GEN	G	G#	A	A#	B	C	C#	D	D#	E	F	F#

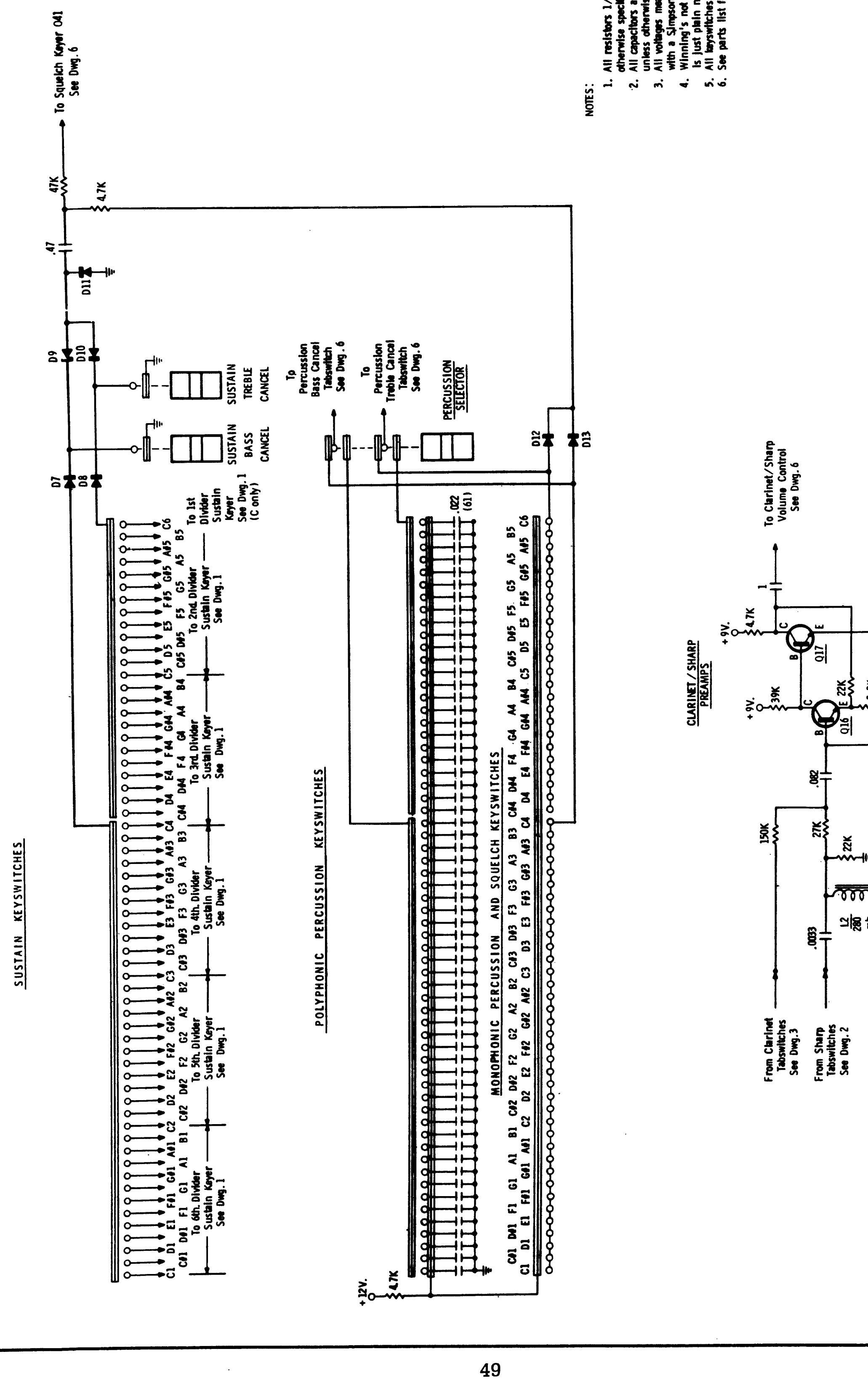
1 3/5 ' CHART

KEY	C	C#	D	D#	E	F	F#	G	G#	A	A#	B
GEN	E	F	F#	G	G#	A	A#	B	C	C#	D	D#

2 2/3 ' CHART

KEY	C	C#	D	D#	E	F	F#	G	G#	A	A#	B
GEN	G	G#	A	A#	B	C	C#	D	D#	E	F	F#

PROFESSIONAL


SUSTAIN KEYSWITCHES
C1 C#1 D1 D#1 E1 F1 F#1 G1 G#1 A1 A#1 B1 C2 C#2 D2 D#2 E2 F2 F#2 G2 G#2 A2 A#2 B2 C3 C#3 D3 D#3 E3 F3 F#3 G3 G#3 A3 A#3 B3 C4 C#4 D4 D#4 E4 F4 F#4 G4 G#4 A4 A#4 B4 C5 C#5 D5 D#5 E5 F5 F#5 G5 G#5 A5 A#5 B5 C6
To 6th. Divider Sustain Keyer See Dwg.1
To 5th. Divider Sustain Keyer See Dwg.1
To 4th. Divider Sustain Keyer See Dwg.1
To 3rd. Divider Sustain Keyer See Dwg.1
To 2nd. Divider Sustain Keyer See Dwg.1
To 1st Divider Sustain Keyer See Dwg.1 (C only)
D7
D8
D9
D10
D11
SUSTAIN BASS CANCEL
SUSTAIN TREBLE CANCEL
.47
47K
4.7K
To Squelch Keyer Q41 See Dwg.6
POLYPHONIC PERCUSSION KEYSWITCHES
To Percussion Bass Cancel Tabswitch See Dwg.6
To Percussion Treble Cancel Tabswitch See Dwg.6
PERCUSSION SELECTOR
D12
D13
D22 (61)
+12V.
4.7K
MONOPHONIC PERCUSSION AND SQUELCH KEYSWITCHES
CLARINET/SHARP PREAMPS
From Clarinet Tabswitches See Dwg.3
From Sharp Tabswitches See Dwg.2
150K
.0033
27K
22K
L2 280 mh
.082
+9V.
39K
Q16
B
C
E
22K
2.2K
+9V.
4.7K
Q17
B
C
E
470K
330K
50
3.3K
1
To Clarinet/Sharp Volume Control See Dwg.6

NOTES:

1. All resistors 1/2 watt 10% unless otherwise specified.
2. All capacitors are in microfarads unless otherwise specified.
3. All voltages measured to ground with a Simpson 260 VOM.
4. Winning's not everything, but losing is just plain nothing!
5. All keyswitches shown in "off" position.
6. See parts list for component part numbers.

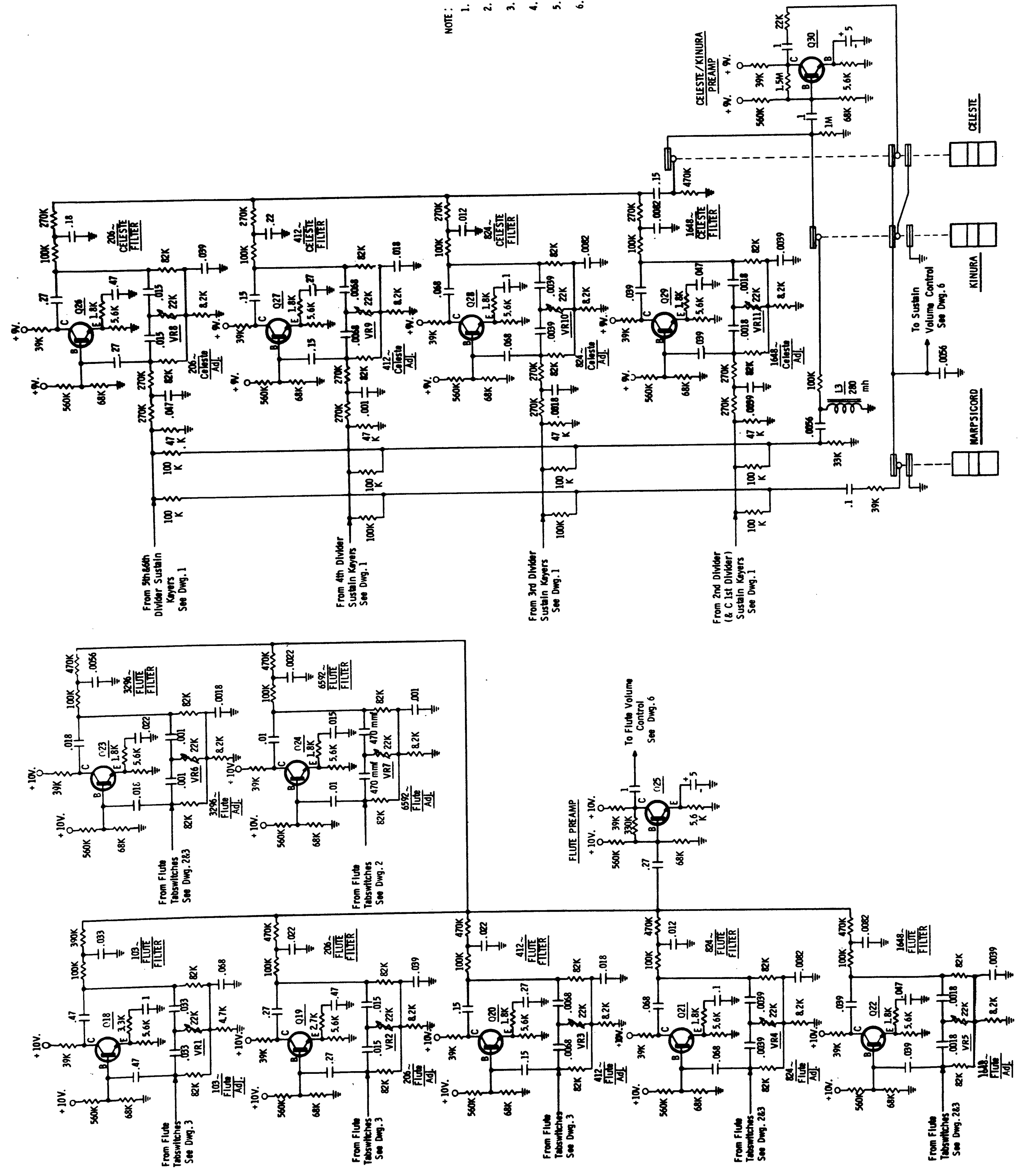
SUSTAIN KEYSWITCHES,
PERCUSSION KEYSWITCHES &
CLARINET/SHARP PREAMP
PP/222
Dwg. No. 4 PROFESSIONAL

PROFESSIONAL

NOTE :

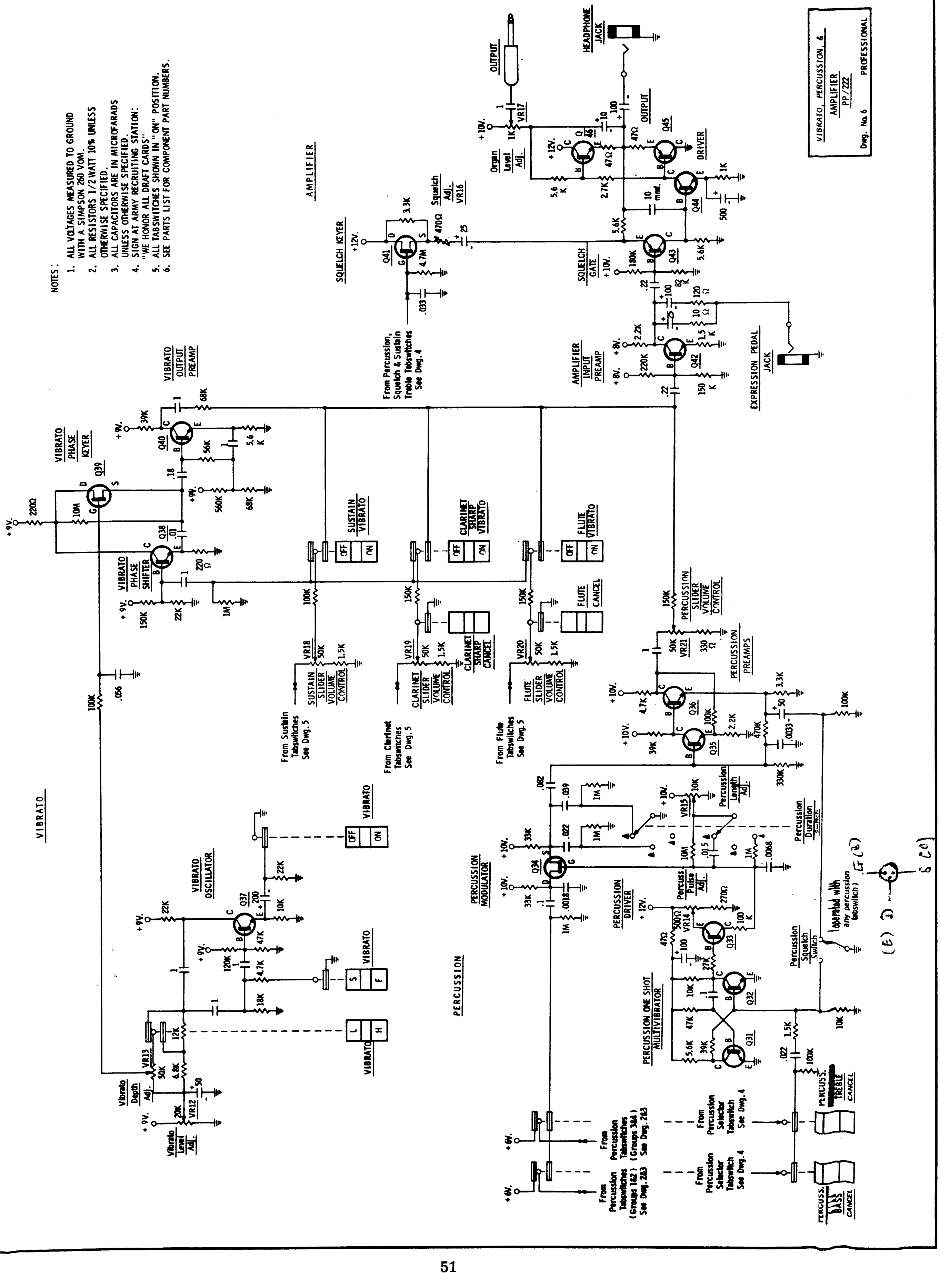
1. ALL RESISTORS 1/2 WATT 10% UNLESS OTHERWISE SPECIFIED.
2. ALL CAPACITORS ARE IN MICROFARADS UNLESS OTHERWISE SPECIFIED.
3. ALL VOLTAGES MEASURED TO GROUND WITH A SIMPSON 260 VOM.
4. EPITAPH ON A PESSIMIST'S HEADSTONE: "I EXPECTED THIS, AND HERE I AM."
5. SEE PARTS LIST FOR COMPONENT PART NUMBERS.
6. ALL TABSWITCHES SHOWN IN "ON" POSITION.

FLUTE FILTERS, CELESTE FILTERS, & PREAMPS
PP/222
Dwg. No. 5 PROFESSIONAL



CELESTE/KINURA PREAMP
Q30
CELESTE
KINURA
HARPSICORD
To Sustain Volume Control See Dwg. 6
L3 280 mh
Q26
206~ CELESTE FILTER
206~ Celeste Adj.
VR8
Q27
412~ CELESTE FILTER
412~ Celeste Adj.
VR9
Q28
824~ CELESTE FILTER
824~ Celeste Adj.
VR10
Q29
1648~ CELESTE FILTER
1648~ Celeste Adj.
VR11
From 5th&6th Divider Sustain Keyers See Dwg. 1
From 4th Divider Sustain Keyers See Dwg. 1
From 3rd Divider Sustain Keyers See Dwg. 1
From 2nd Divider (& C 1st Divider) Sustain Keyers See Dwg. 1
Q23
3296~ FLUTE FILTER
3296~ Flute Adj.
VR6
Q24
6592~ FLUTE FILTER
6592~ Flute Adj.
VR7
From Flute Tabswitches See Dwg. 2&3
From Flute Tabswitches See Dwg. 2
FLUTE PREAMP
Q25
To Flute Volume Control See Dwg. 6
Q18
103~ FLUTE FILTER
103~ Flute Adj.
VR1
Q19
206~ FLUTE FILTER
206~ Flute Adj.
VR2
Q20
412~ FLUTE FILTER
412~ Flute Adj.
VR3
Q21
824~ FLUTE FILTER
824~ Flute Adj.
VR4
Q22
1648~ FLUTE FILTER
1648~ Flute Adj.
VR5
From Flute Tabswitches See Dwg. 3
From Flute Tabswitches See Dwg. 3
From Flute Tabswitches See Dwg. 3
From Flute Tabswitches See Dwg. 2&3
From Flute Tabswitches See Dwg. 2&3
+10V.
+9V.

PROFESSIONAL

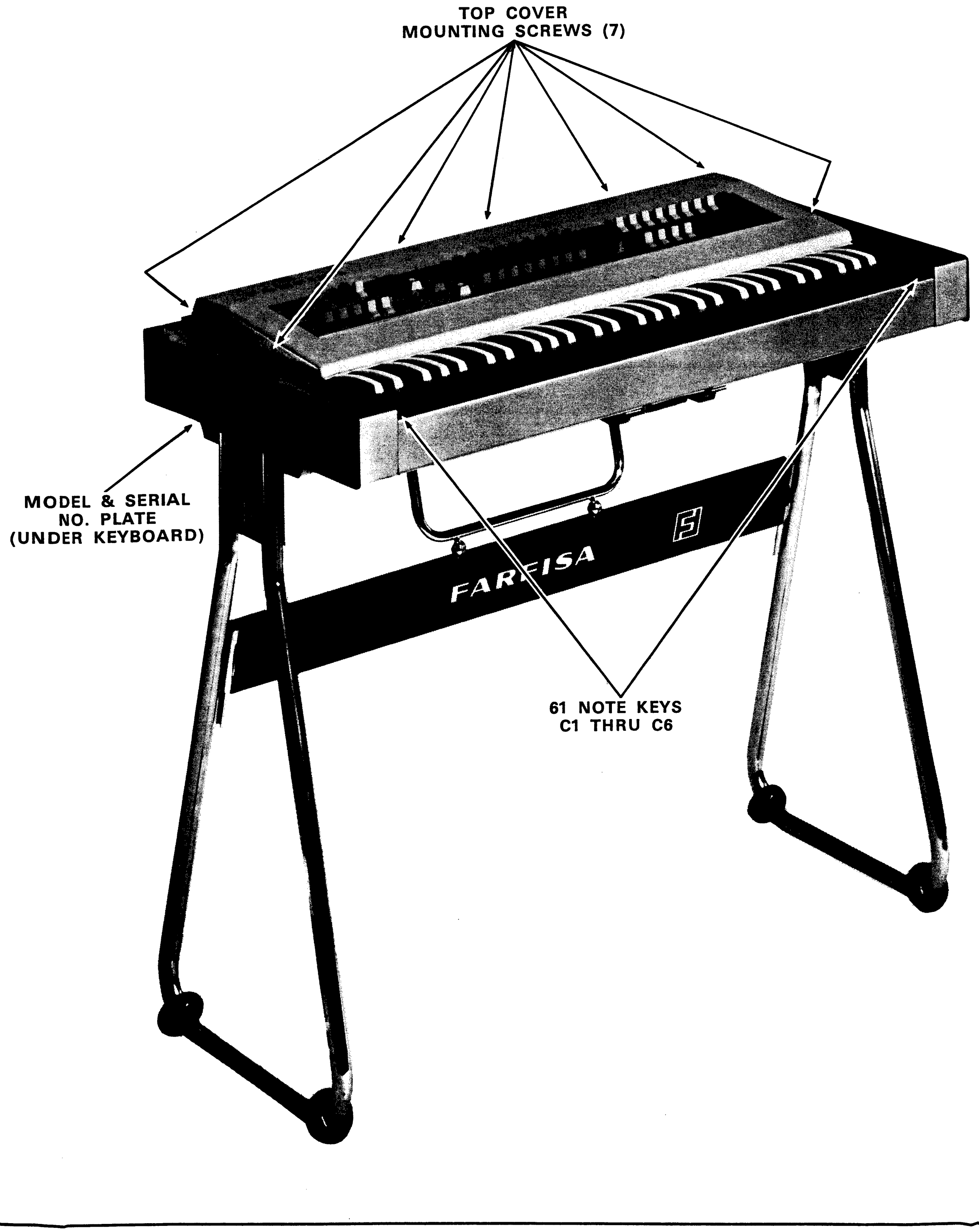


NOTES:
1. ALL VOLTAGES MEASURED TO GROUND WITH A SIMPSON 260 VOM.
2. ALL RESISTORS 1/2 WATT 10% UNLESS OTHERWISE SPECIFIED.
3. ALL CAPACITORS ARE IN MICROFARADS UNLESS OTHERWISE SPECIFIED.
4. SIGN AT ARMY RECRUITING STATION: "WE HONOR ALL DRAFT CARDS"
5. ALL TABSWITCHES SHOWN IN "ON" POSITION.
6. SEE PARTS LIST FOR COMPONENT PART NUMBERS.

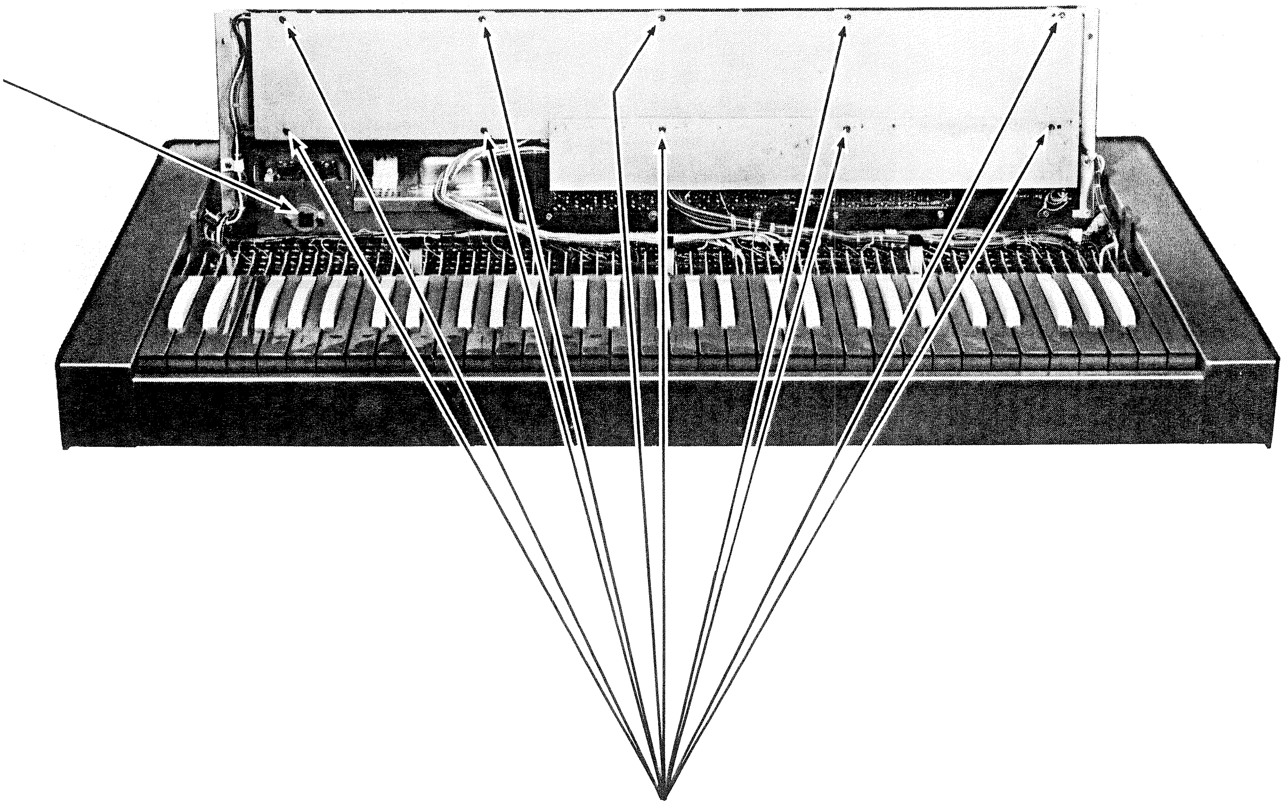
VIBRATO, PERCUSSION, & AMPLIFIER
PP/222
Dwg. No. 6 PROFESSIONAL

AMPLIFIER
VIBRATO
PERCUSSION
OUTPUT
HEADPHONE JACK
Organ Level Adj. VR17
Squelch Adj. VR16
SQUELCH KEYER Q41
SQUELCH GATE Q43
DRIVER Q45
Q44
Q46
OUTPUT
AMPLIFIER INPUT PREAMP Q42
EXPRESSION PEDAL JACK
From Percussion, Squelch & Sustain Treble Tabswitches See Dwg.4
VIBRATO OUTPUT PREAMP Q40
VIBRATO PHASE KEYER Q39
VIBRATO PHASE SHIFTER Q38
SUSTAIN VIBRATO
CLARINET SHARP VIBRATO
FLUTE VIBRATO
OFF ON
FLUTE CANCEL
CLARINET SHARP CANCEL
VR18 SUSTAIN SLIDER VOLUME CONTROL
VR19 CLARINET SLIDER VOLUME CONTROL
VR20 FLUTE SLIDER VOLUME CONTROL
From Sustain Tabswitches See Dwg.5
From Clarinet Tabswitches See Dwg.5
From Flute Tabswitches See Dwg.5
PERCUSSION SLIDER VOLUME CONTROL VR21
PERCUSSION PREAMPS Q36 Q35
Percussion Length Adj. VR15
Percussion Duration
PERCUSSION MODULATOR Q34
PERCUSSION DRIVER Q33
Percuss Pulse Adj. VR14
PERCUSSION ONE SHOT MULTIVIBRATOR Q32 Q31
Percussion Squelch Switch
Ganged with any percussion tabswitch)
PERCUSS. TREBLE CANCEL
PERCUSS. BASS CANCEL
From Percussion Selector Tabswitch See Dwg.4
From Percussion Tabswitches (Groups 3&4) See Dwg.2&3
From Percussion Tabswitches (Groups 1&2) See Dwg.2&3
VIBRATO OSCILLATOR Q37
VIBRATO OFF ON
VIBRATO S F
VIBRATO L H
Vibrato Depth Adj. VR13
Vibrato Level Adj. VR12
+9V. +10V. +12V. +8V. +6V.

FRONT VIEW
PROFESSIONAL


TOP COVER
MOUNTING SCREWS (7)
MODEL & SERIAL
NO. PLATE
(UNDER KEYBOARD)
FARFISA
61 NOTE KEYS
C1 THRU C6

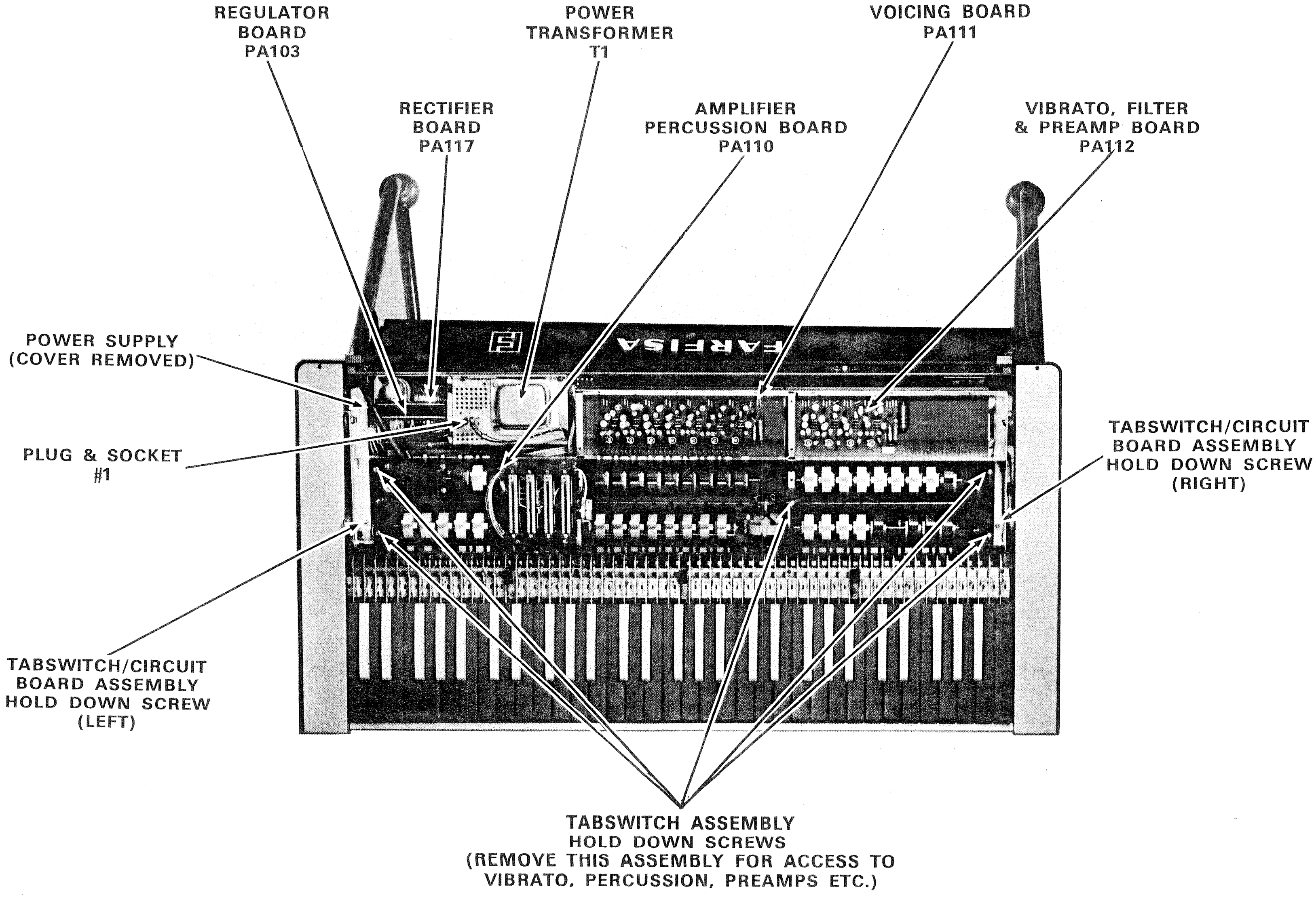
FRONT VIEW
PROFESSIONAL
(Tabswitch Assembly Raised)



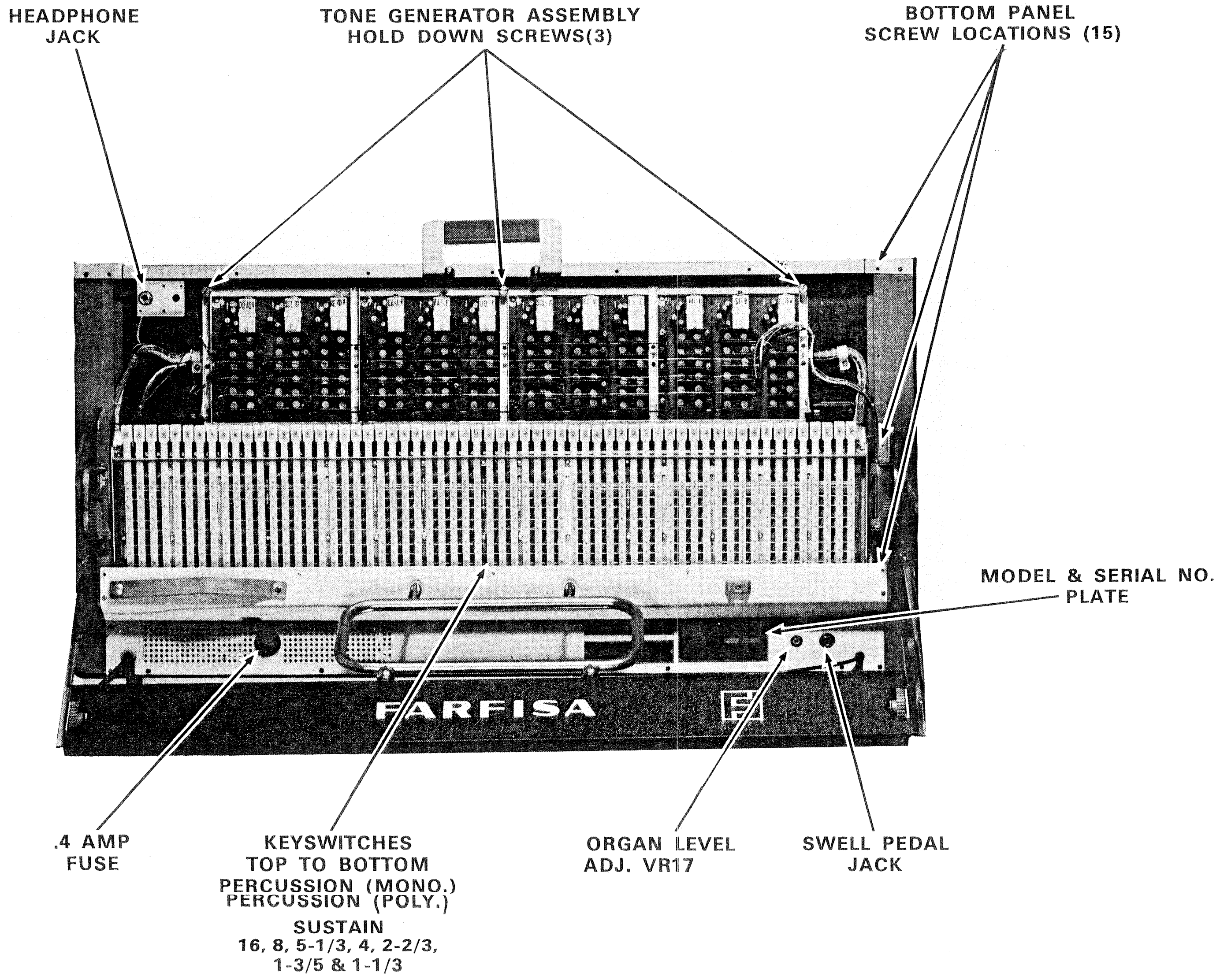
VOLTAGE REGULATOR TRANSISTOR Q49

PRINTED CIRCUIT BOARD BOTTOM COVER MOUNTING SCREWS (10)

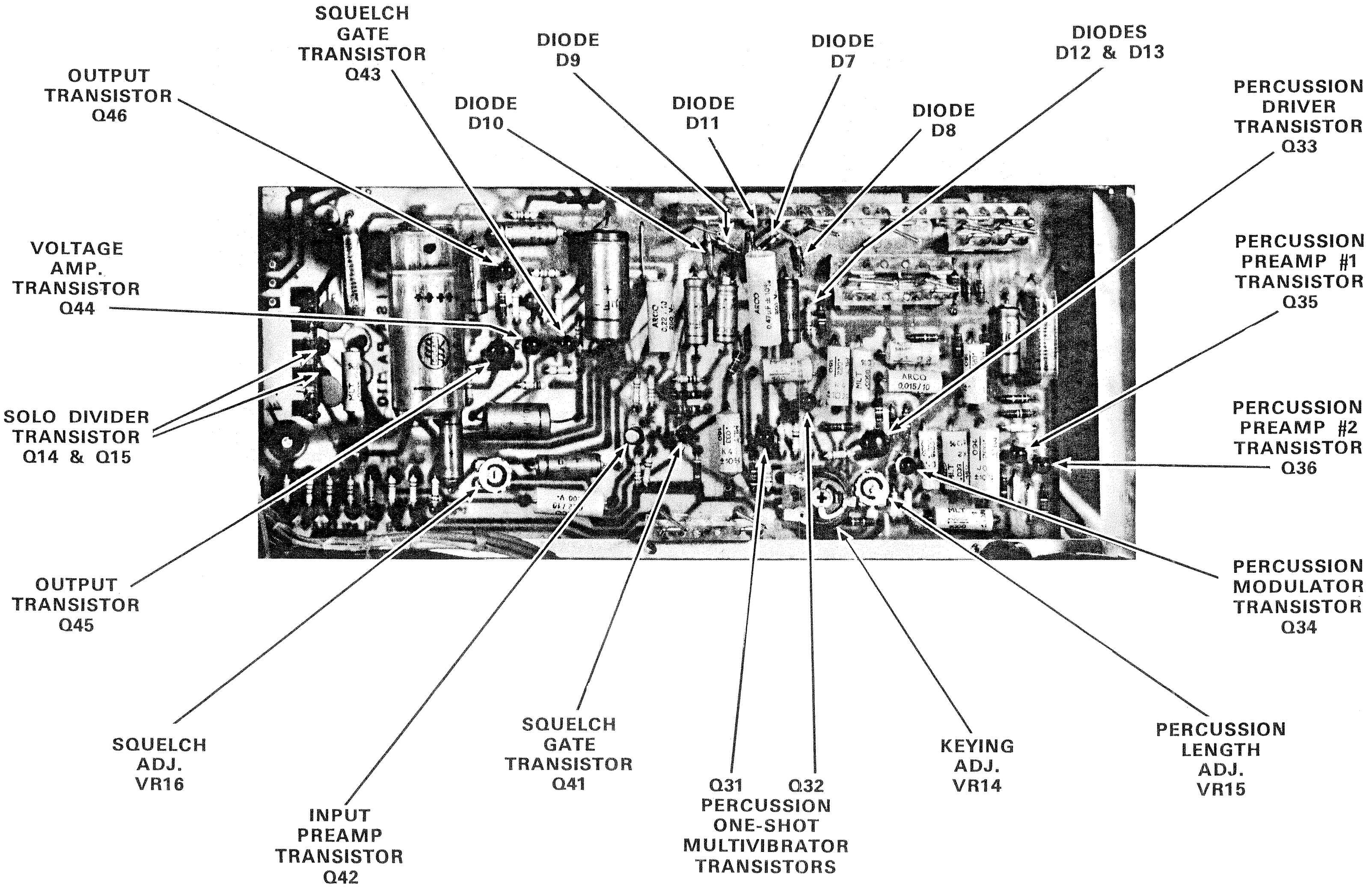
TOP VIEW
(With Cover Removed)


REGULATOR BOARD PA103
POWER TRANSFORMER T1
VOICING BOARD PA111
RECTIFIER BOARD PA117
AMPLIFIER PERCUSSION BOARD PA110
VIBRATO, FILTER & PREAMP BOARD PA112
POWER SUPPLY (COVER REMOVED)
PLUG & SOCKET #1
TABSWITCH/CIRCUIT BOARD ASSEMBLY HOLD DOWN SCREW (RIGHT)
TABSWITCH/CIRCUIT BOARD ASSEMBLY HOLD DOWN SCREW (LEFT)
TABSWITCH ASSEMBLY HOLD DOWN SCREWS (REMOVE THIS ASSEMBLY FOR ACCESS TO VIBRATO, PERCUSSION, PREAMPS ETC.)
FARFISA

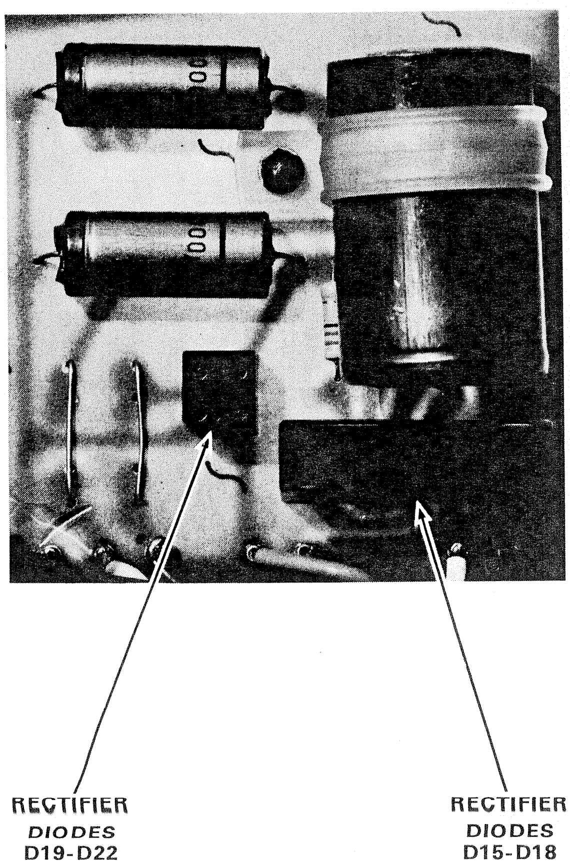
BOTTOM VIEW
PROFESSIONAL


HEADPHONE JACK
TONE GENERATOR ASSEMBLY HOLD DOWN SCREWS(3)
BOTTOM PANEL SCREW LOCATIONS (15)
MODEL & SERIAL NO. PLATE
.4 AMP FUSE
KEYSWITCHES TOP TO BOTTOM
PERCUSSION (MONO.)
PERCUSSION (POLY.)
SUSTAIN
16, 8, 5-1/3, 4, 2-2/3, 1-3/5 & 1-1/3
ORGAN LEVEL ADJ. VR17
SWELL PEDAL JACK
FARFISA

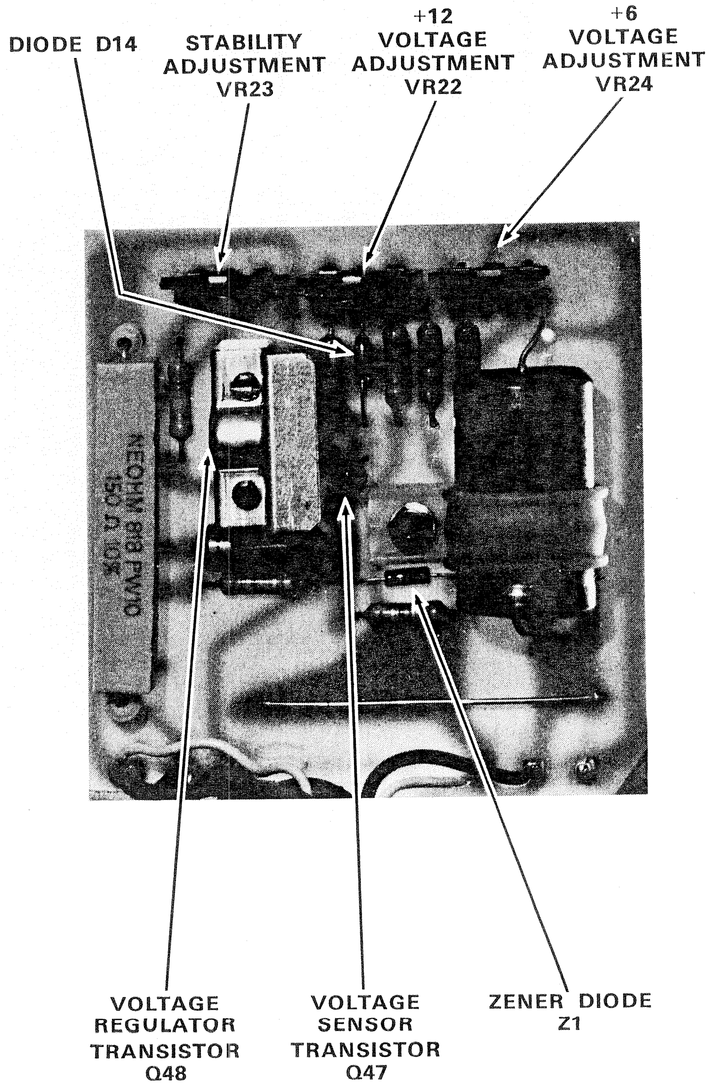
AMPLIFIER & PERCUSSION BOARD
PROFESSIONAL
(PA-110)


OUTPUT TRANSISTOR Q46
SQUELCH GATE TRANSISTOR Q43
DIODE D10
DIODE D9
DIODE D11
DIODE D7
DIODE D8
DIODES D12 & D13
PERCUSSION DRIVER TRANSISTOR Q33
PERCUSSION PREAMP #1 TRANSISTOR Q35
PERCUSSION PREAMP #2 TRANSISTOR Q36
PERCUSSION MODULATOR TRANSISTOR Q34
VOLTAGE AMP. TRANSISTOR Q44
SOLO DIVIDER TRANSISTOR Q14 & Q15
OUTPUT TRANSISTOR Q45
SQUELCH ADJ. VR16
INPUT PREAMP TRANSISTOR Q42
SQUELCH GATE TRANSISTOR Q41
Q31 Q32 PERCUSSION ONE-SHOT MULTIVIBRATOR TRANSISTORS
KEYING ADJ. VR14
PERCUSSION LENGTH ADJ. VR15

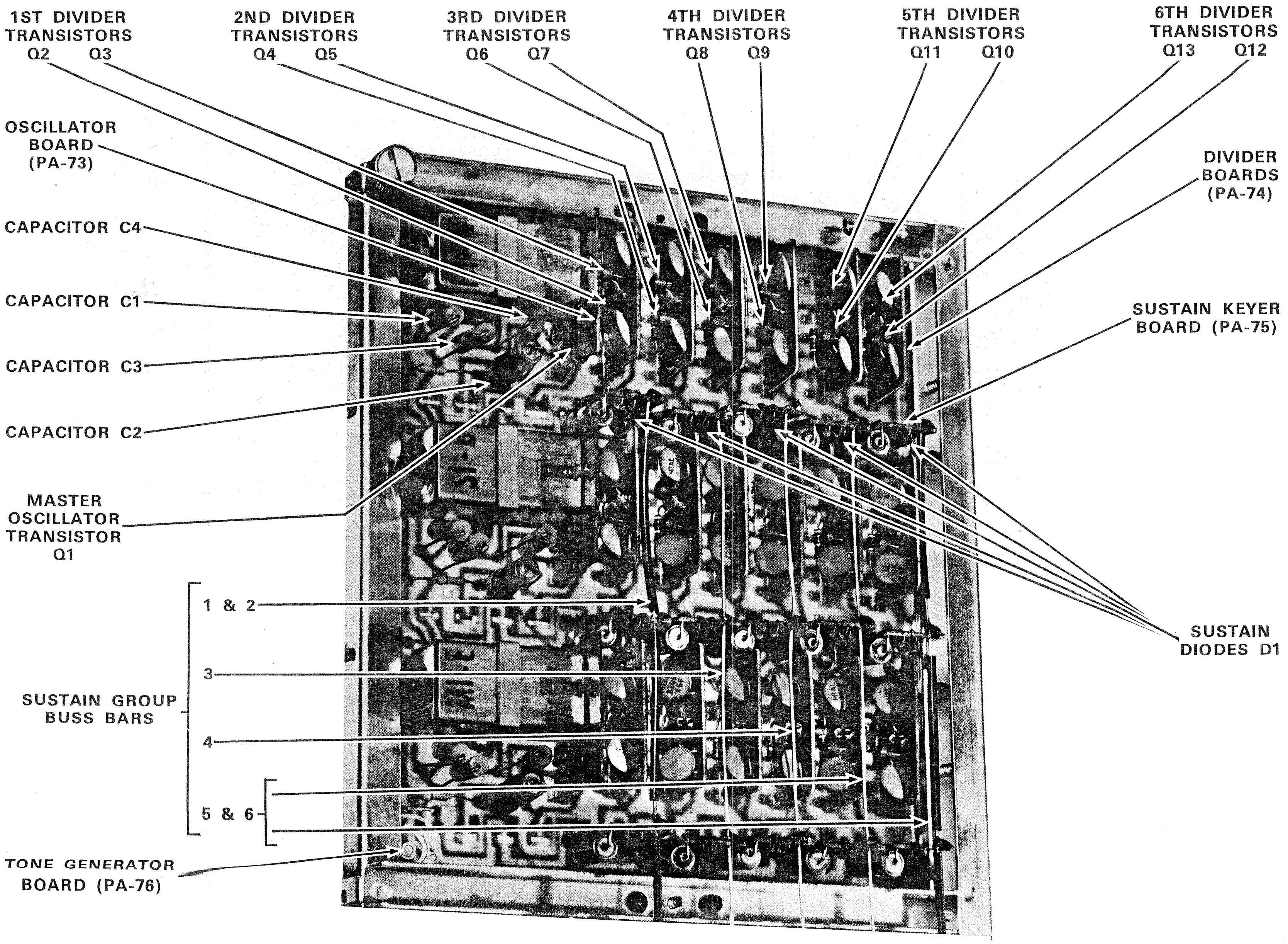
RECTIFIER BOARD
PROFESSIONAL
(PA-117)


RECTIFIER DIODES D19-D22
RECTIFIER DIODES D15-D18

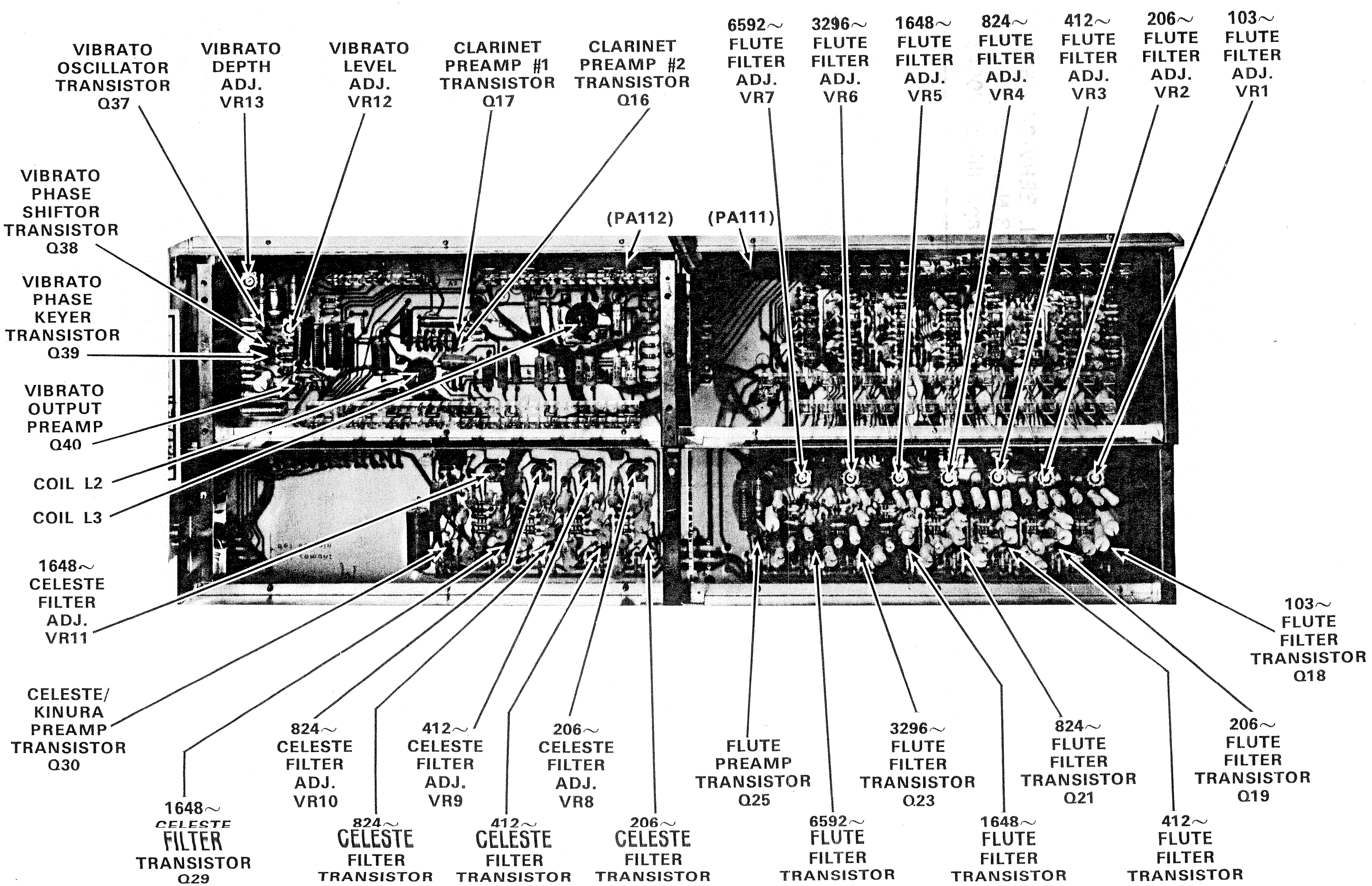
REGULATOR BOARD
PROFESSIONAL
(PA-103)


DIODE D14
STABILITY ADJUSTMENT VR23
+12 VOLTAGE ADJUSTMENT VR22
+6 VOLTAGE ADJUSTMENT VR24
NEOHM 818 PW10
150 Ω 10%
VOLTAGE REGULATOR TRANSISTOR Q48
VOLTAGE SENSOR TRANSISTOR Q47
ZENER DIODE Z1

TONE GENERATOR BOARD
(With Oscillator, Divider & Sustain Keyer Boards)
PROFESSIONAL


1ST DIVIDER TRANSISTORS Q2 Q3
2ND DIVIDER TRANSISTORS Q4 Q5
3RD DIVIDER TRANSISTORS Q6 Q7
4TH DIVIDER TRANSISTORS Q8 Q9
5TH DIVIDER TRANSISTORS Q11 Q10
6TH DIVIDER TRANSISTORS Q13 Q12
OSCILLATOR BOARD (PA-73)
DIVIDER BOARDS (PA-74)
CAPACITOR C4
CAPACITOR C1
SUSTAIN KEYER BOARD (PA-75)
CAPACITOR C3
CAPACITOR C2
MASTER OSCILLATOR TRANSISTOR Q1
1 & 2
SUSTAIN DIODES D1
3
SUSTAIN GROUP BUSS BARS
4
5 & 6
TONE GENERATOR BOARD (PA-76)

VIBRATO, FILTER & PREAMP BOARD (PA-112) & VOICING BOARD (PA-111)
PROFESSIONAL


VIBRATO OSCILLATOR TRANSISTOR Q37
VIBRATO DEPTH ADJ. VR13
VIBRATO LEVEL ADJ. VR12
CLARINET PREAMP #1 TRANSISTOR Q17
CLARINET PREAMP #2 TRANSISTOR Q16
6592~ FLUTE FILTER ADJ. VR7
3296~ FLUTE FILTER ADJ. VR6
1648~ FLUTE FILTER ADJ. VR5
824~ FLUTE FILTER ADJ. VR4
412~ FLUTE FILTER ADJ. VR3
206~ FLUTE FILTER ADJ. VR2
103~ FLUTE FILTER ADJ. VR1
VIBRATO PHASE SHIFTOR TRANSISTOR Q38
(PA112)
(PA111)
VIBRATO PHASE KEYER TRANSISTOR Q39
VIBRATO OUTPUT PREAMP Q40
COIL L2
COIL L3
1648~ CELESTE FILTER ADJ. VR11
103~ FLUTE FILTER TRANSISTOR Q18
CELESTE/ KINURA PREAMP TRANSISTOR Q30
824~ CELESTE FILTER ADJ. VR10
412~ CELESTE FILTER ADJ. VR9
206~ CELESTE FILTER ADJ. VR8
FLUTE PREAMP TRANSISTOR Q25
3296~ FLUTE FILTER TRANSISTOR Q23
824~ FLUTE FILTER TRANSISTOR Q21
206~ FLUTE FILTER TRANSISTOR Q19
1648~ CELESTE FILTER TRANSISTOR Q29
824~ CELESTE FILTER TRANSISTOR Q28
412~ CELESTE FILTER TRANSISTOR Q27
206~ CELESTE FILTER TRANSISTOR Q26
6592~ FLUTE FILTER TRANSISTOR Q24
1648~ FLUTE FILTER TRANSISTOR Q22
412~ FLUTE FILTER TRANSISTOR Q20

PARTS INFORMATION

STANDARD PARTS

Replacements for all standard electronic parts and hardware may be purchased directly from local suppliers generally in less time than would be required to obtain them from the factory.

SPECIAL PARTS

In addition to the standard replacement parts, special electronic and mechanical parts are also used. These parts are manufactured by and to the specifications of the factory. Order these parts directly from the factory since they would be difficult or impossible to obtain from other sources.

PARTS ORDERING INFORMATION

When ordering parts be sure to include the following information:

1. Model and Serial Number
2. Part Number
3. A description of the part
4. Specify how you want the part shipped.

Most special electronic parts and mechanical parts will have a part number stamped on them. In the event that the part number is missing, or you are unable to read the part number, a complete description of the part and where it is used will allow the factory to fill your parts order. When parts are ordered in the proper manner the factory is able to fill your orders promptly—delays that might result are avoided.

ADDRESS PARTS ORDERS TO:

C.M.I. SERVICE DEPT.
7373 No. Cicero Ave.
Chicago, Illinois 60646

IMPORTANT

IN ANY CORRESPONDENCE CONCERNING THIS INSTRUMENT ALWAYS INCLUDE MODEL AND SERIAL NUMBERS

PARTS LIST

THE PARTS LIST CONTAINS THE FOLLOWING INFORMATION:

1. Name of Part
2. Value, Tolerance and Code (when important)
3. Brief description
4. Where the part is found (assembly, printed circuit board and etc.)
5. Schematic Reference Number
6. PART NUMBER — USE IT!

This parts list includes all standard stock replacement parts. No attempt has been made to include every nut, bolt and screw. If the necessity for a non-listed part arises, please write describing the part's location and function as well as model and serial number of the unit.

FAST 2

PART	DESCRIPTION	SCHEMATIC REFERENCE	PART NUMBER
AMPLIFIER BOARD			
Assembly	Amplifier Board Complete (PA58)		996-011320
Capacitor	Electrolytic 10 UF 65V		945-011203-32
Capacitor	Electrolytic 100 UF 35V		945-011203-19
Capacitor	Electrolytic 500 UF 45V		945-011203-11
Capacitor	Electrolytic 1000 UF 35V		945-011203-22
Coil	3 MH	L3, 4	956-011321
Diode	1X9179	D2	915-011215
Potentiometer	1K Bias Adj.	VR5	925-011322
Potentiometer	100K Organ Volume Adj.	VR4	925-011323
Transistor	Input Preamp (1W9640)	Q16	991-011225
Transistor	Bias Transistor (BC107)	Q17	991-011313
Transistor	Voltage Amp & Driver #1 (BC142)	Q18, 19	991-011314
Transistor	Driver #2 (BC143)	Q20	991-011315
Transistor	Power (T1P14)	Q21, 22	992-011317
CONSOLE ASSEMBLY			
Cord	A.C.		989-011268
Jack	Expression Pedal		910-011263
Jack	Amplifier		910-011325
Knob	Bass & Organ Volume (Gray, Silver Cap)		915-011324
Pilot Light			939-011326
Potentiometer	47K Bass & Organ Volume Controls	VR2, 3	925-011310
Speaker	8 Ohm		985-011327
Switch	A.C. Off-On		960-011267
DIVIDER BOARD			
Assembly	Divider Board (PA74)		996-011345
Capacitor	Polystyrene 820 MMF		946-011205-821
Transistor	Divider (1W9787)	Q4-13	991-011318
KEYSWITCH ASSEMBLY			
Key	A Natural White		964-011330-1
Key	B Natural White		964-011330-2
Key	C Natural White		964-011330-3
Key	D Natural White		964-011330-4
Key	E Natural White		964-011330-5
Key	F Natural White		964-011330-6
Key	G Natural White		964-011330-7
Key	A Natural Gray		964-011331-1
Key	B Natural Gray		964-011331-2
Key	C Natural Gray		964-011331-3
Key	D Natural Gray		964-011331-4
Key	E Natural Gray		964-011331-5
Key	F Natural Gray		964-011331-6
Key	G Natural Gray		964-011331-7
Key	All Sharp—Gray		964-011332-1
Key	All Sharp—White		964-011332-2
Spring	Key Contact		917-011333
Spring	Sharp Key Balance		975-011239
Spring	Natural Key Balance		975-011283

FAST 2

OSCILLATOR BOARD

PART	DESCRIPTION	SCHEMATIC REFERENCE	PART NUMBER
Assembly	F#, B, E Oscillator Board Complete (PA91)		996-011334-1
Assembly	A, D, G Oscillator Board Complete (PA91)		996-011334-2
Assembly	C, F, A# Oscillator Board Complete (PA91)		996-011334-3
Assembly	D#, G#, C# Oscillator Board Complete (PA91)		996-011334-4
Assembly	A Oscillator Board Complete (PA73)		996-011335-1
Assembly	A# Oscillator Board Complete (PA73)		996-011335-2
Assembly	B Oscillator Board Complete (PA73)		996-011335-3
Assembly	C Oscillator Board Complete (PA73)		996-011335-4
Assembly	C# Oscillator Board Complete (PA73)		996-011335-5
Assembly	D Oscillator Board Complete (PA73)		996-011335-6
Assembly	D# Oscillator Board Complete (PA73)		996-011335-7
Assembly	E Oscillator Board Complete (PA73)		996-011335-8
Assembly	F Oscillator Board Complete (PA73)		996-011335-9
Assembly	F# Oscillator Board Complete (PA73)		996-011335-10
Assembly	G Oscillator Board Complete (PA73)		996-011335-11
Assembly	G# Oscillator Board Complete (PA73)		996-011335-12
Coil	Tuning (Blue Dot)	L1	952-011336
Coil	Tuning (Red Dot)	L1	952-011337
Diode	1W9179	D1	919-011215
Transistor	Oscillator (1W9810/3)	Q3	991-011319

POWER SUPPLY

PART	DESCRIPTION	SCHEMATIC REFERENCE	PART NUMBER
Assembly	Power Supply Complete		997-011338
Capacitor	Electrolytic 1000 UF 25V		945-011203-18
Capacitor	Electrolytic 2000 UF 55V		945-011203-36
Diode	Rectifier (BYY31)	D3-6	919-011339
Diode	Zener (ZX12)	Z1	919-011340
Fuse	.4 Amp		939-011341
Holder	Fuse		906-006303
Resistor	39 Ohm 20 Watt		924-011230-10
Transformer	Power (1046)	T1	954-011342

TABSWITCH ASSEMBLY

PART	DESCRIPTION	SCHEMATIC REFERENCE	PART NUMBER
Spring	Contact		975-011243
Tab	Flute		915-011344-1
Tab	Clarinet		915-011344-2
Tab	Reed		915-011344-3
Tab	Strings		915-011344-4
Tab	Vibrato Off-On		915-011344-5
Tab	Slow-Fast		915-011344-6

VIBRATO & PREAMP BOARD

PART	DESCRIPTION	SCHEMATIC REFERENCE	PART NUMBER
Assembly	Vibrato & Preamp Board Complete (PA92)		996-011323
Capacitor	Electrolytic 25 UF 40V		945-011203-7
Capacitor	Electrolytic 100 UF 12V		945-011203-10
Capacitor	Electrolytic 200 UF 12V		945-011203-16
Capacitor	Electrolytic 200 UF 25V		945-011203-20
Coil	2H Filter	L2	956-011205
Potentiometer	Vibrato Speed (22K)	VR1	925-011329
Transistor	Emitter Follower, Preamp #2 (BC113)	Q2, 15	991-011219
Transistor	Preamp #1 (BC149)	Q14	991-011315
Transistor	Oscillator (1W9787)	Q1	991-011318

FAST 3

CONSOLE ASSEMBLY

PART	DESCRIPTION	SCHEMATIC REFERENCE	PART NUMBER
Cord	A.C. Power		989-011268
Handle	Cabinet		930-013024-1
Knob	Organ Volume (Gray/Silver Cap)		915-011324
Leg (Left)	Cabinet		939-013024-1
Leg (Right)	Cabinet		939-013024-2
Light	Pilot		939-013025

KEYSWITCH ASSEMBLY

PART	DESCRIPTION	SCHEMATIC REFERENCE	PART NUMBER
Actuator	Keyswitch		964-013026
Key	C Natural Dark Gray (Bass)		964-013027-C
Key	D Natural Dark Gray (Bass)		964-013027-D
Key	E Natural Dark Gray (Bass)		964-013027-E
Key	F Natural Dark Gray (Bass)		964-013027-F
Key	G Natural Dark Gray (Bass)		964-013027-G
Key	A Natural Dark Gray (Bass)		964-013027-A
Key	B Natural Dark Gray (Bass)		964-013027-B
Key	C Natural Gray (Treble)		964-013028-C
Key	D Natural Gray (Treble)		964-013028-D
Key	E Natural Gray (Treble)		964-013028-E
Key	F Natural Gray (Treble)		964-013028-F
Key	G Natural Gray (Treble)		964-013028-G
Key	A Natural Gray (Treble)		964-013028-A
Key	B Natural Gray (Treble)		964-013028-B
Key	All Sharps (White)		964-013029
Spring	Key Contact		975-013030
Spring	Bass Contact		975-013031
Spring	Pull Down Actuator		975-013032
Spring	Pull Down Key		975-013033

POWER SUPPLY CHASSIS

PART	DESCRIPTION	SCHEMATIC REFERENCE	PART NUMBER
Capacitor	Electrolytic 500 UF 15V		945-011203-23
Capacitor	Electrolytic 500 UF 50V		945-011203-24
Diode	Rectifier	D1-4	919-013036
Diode	Zener (5524)	Z2	919-013035
Fuse	.2 Amp		939-013034
Holder	Fuse		906-006303
Resistor	120 Ohm 10W		924-011330-5
Transformer	Power (T-1042)	T1	954-013037

PREAMP BOARD

PART	DESCRIPTION	SCHEMATIC REFERENCE	PART NUMBER
Assembly	Preamp Board (PA-62)		996-013020
Capacitor	Electrolytic 100 UF 12V		945-011203-10
Transistor	Preamp #1, #2 & Output (BC 149)	Q13-15	991-013116

TABSWITCH ASSEMBLY

PART	DESCRIPTION	SCHEMATIC REFERENCE	PART NUMBER
Spring	Tabswitch Contact		975-011243
Tab	Manual Bass Selector Treble-Bass		915-011344-7
Tab	PF		915-011344-8
Tab	Bass 16′		915-011344-9

FAST 3

PART	DESCRIPTION	SCHEMATIC REFERENCE	PART NUMBER
Tab	Clarinet 16′		915-011344-10
Tab	Flute 8′		915-011344-11
Tab	Oboe 8′		915-011344-12
Tab	Trumpet 8′		915-011344-13
Tab	Strings 8′		915-011344-14
Tab	Flute 4′		915-011344-15
Tab	Vibrato Off-On		915-011344-5
Tab	Slow-Fast		915-011344-6

TONE GENERATOR BOARDS

PART	DESCRIPTION	SCHEMATIC REFERENCE	PART NUMBER
Assembly	A Generator Board Complete (PA-23)		996-013021-C
Assembly	A# Generator Board Complete (PA-23)		996-013021-C#
Assembly	B Generator Board Complete (PA-23)		996-013021-D
Assembly	C Generator Board Complete (PA-23)		996-013021-D#
Assembly	C# Generator Board Complete (PA-23)		996-013021-E
Assembly	D Generator Board Complete (PA-23)		996-013021-F
Assembly	D# Generator Board Complete (PA-23)		996-013021-F#
Assembly	E Generator Board Complete (PA-23)		996-013021-G
Assembly	F Generator Board Complete (PA-23)		996-013021-G#
Assembly	F# Generator Board Complete (PA-23)		996-013021-A
Assembly	G Generator Board Complete (PA-23)		996-013021-A#
Assembly	G# Generator Board Complete (PA-23)		996-013021-B
Capacitor	Electrolytic 25 UF 25V		945-011203-25
Coil	Tuning (C—F# Yellow Dot)	L1	952-011207-1
Coil	Tuning (G—B Green Dot)	L1	952-011207-2
Transistor	Oscillator (Y 363)	Q3	991-011224
Transistor	Divider (SFT 352)	Q5-10	991-011222

VIBRATO/BASS BOARD

PART	DESCRIPTION	SCHEMATIC REFERENCE	PART NUMBER
Assembly	Vibrato/Bass Board (PA-60)		996-013018
Capacitor	Electrolytic 1 UF 40V		945-011203-1
Capacitor	Electrolytic 5 UF 25V		945-011203-2
Capacitor	Electrolytic 50 UF 12V		945-011203-8
Capacitor	Electrolytic 100 UF 12V		945-011203-10
Potentiometer	Vibrato Speed (10K)	VR1	925-011232
Transistor	Vibrato Oscillator (SFT 353)	Q1	991-011223
Transistor	Vibrato Emitter Follower (SFT 367)	Q2	991-011217
Transistor	Bass Divider (SFT 352)	Q11, 12	991-011222

VOICING BOARD

PART	DESCRIPTION	SCHEMATIC REFERENCE	PART NUMBER
Assembly	Voicing Board (PA-61)		996-013019
Capacitor	Electrolytic 1 UF 40V		945-011203-1
Capacitor	Electrolytic 100 UF 12V		945-011203-10
Coil	Filter (220 MH)	L2, 3	952-013022
Coil	Filter (450 MH)	L4, 5	952-013023
Potentiometer	D.C. Balancing (10K)	VR3	925-011232

FAST 4 & 5

PART	DESCRIPTION	SCHEMATIC REFERENCE	PART NUMBER

CELEST FILTER BOARD (FAST 5 ONLY)

Assembly	Celest Filter Board (PA-105)		996-013043
Potentiometer	22K Celest Filter Adj.	VR12, 13	925-011329
Transistor	Celest Filter (BC 114)	Q38, 39	991-013044

CONSOLE ASSEMBLY

Cord	A.C. Power		989-011268
Handle	Cabinet (Fast 4)		930-013024-2
Handle	Cabinet (Fast 5)		930-013024-3
Jack	Headphone		906-013038
Jack	Swell Pedal		906-013039
Knob	Bass Volume (Gray/Silver Cap)		915-011324
Light	Pilot		939-013040
Socket	Bass Pedals		906-013041
Switch	Off/On Power		960-013042

FLUTE FILTER BOARD

Assembly	Flute Filter Board (PA-97)		996-013046
Potentiometer	22K Flute Filter Adj.	VR7-9	925-011329
Transistor	Filter (BC 114)	Q24-26	991-013044

KEYSWITCH ASSEMBLY

Actuator	Keyswitch (White Plastic)		964-013049
Key	C Natural Black (Bass)		964-013038-C
Key	D Natural Black (Bass)		964-013038-D
Key	E Natural Black (Bass)		964-013038-E
Key	F Natural Black (Bass)		964-013038-F
Key	G Natural Black (Bass)		964-013038-G
Key	A Natural Black (Bass)		964-013038-A
Key	B Natural Black (Bass)		964-013038-B
Key	C Natural Dark Gray (Bass/Treble)		964-013027-C
Key	D Natural Dark Gray (Bass/Treble)		964-013027-D
Key	E Natural Dark Gray (Bass/Treble)		964-013027-E
Key	F Natural Dark Gray (Bass/Treble)		964-013027-F
Key	G Natural Dark Gray (Bass/Treble)		964-013027-G
Key	A Natural Dark Gray (Bass/Treble)		964-013027-A
Key	B Natural Dark Gray (Bass/Treble)		964-013027-B
Key	C Natural Gray (Treble)		964-013028-C
Key	D Natural Gray (Treble)		964-013028-D
Key	E Natural Gray (Treble)		964-013028-E
Key	F Natural Gray (Treble)		964-013028-F
Key	G Natural Gray (Treble)		964-013028-G
Key	A Natural Gray (Treble)		964-013028-A
Key	B Natural Gray (Treble)		964-013028-B
Key	All Sharps (White)		964-013029
Spring	Actuator Pull Down		975-013050
Spring	Key Contact		975-013051

FAST 4 & 5

PART	DESCRIPTION	SCHEMATIC REFERENCE	PART NUMBER
MUTE BOARD (FAST 5 ONLY)			
Assembly	Muter Board (PA-113)		996-013052
Capacitor	Electrolytic 10 UF 12V		996-011203-29
Capacitor	Electrolytic 1000 UF 15V		945-011203-30
Capacitor	Electrolytic 2000 UF 20V		945-011203-31
Diode	Keying (X981)		919-013053
Transistor	Preamps, #1, #2, Driver & Muter (BC 113)	Q43-46	991-011219
OBOE & TRUMPET FILTER BOARD			
Assembly	Oboe & Trumpet Filter Board (PA-99)		996-013048
Capacitor	Electrolytic 1 UF 250V		945-011203-28
Capacitor	Electrolytic 50 UF 12V		945-011203-8
Capacitor	Electrolytic 100 UF 12V		945-011203-10
Transistor	Filter & Output (BC 114)	Q28, 29, 37	991-013044
PERCUSSION BOARD			
Assembly	Percussion Board (PA-100)		996-013054
Capacitor	Electrolytic 5 UF 12V		945-011203-27
Capacitor	Electrolytic 100 UF 15V		945-011203-33
Capacitor	Electrolytic 1000 UF 25V		945-011203-18
Potentiometer	10K Percussion Length Adj	VR10	925-011231
Potentiometer	1K Percussion Attack Adj	VR11	925-011232
Transistor	Multi & Pulse Detector (1W9787)	Q31-33	991-011318
Transistor	Driver (1W9810/1)	Q34	991-011319
Transistor	Keyer (PAC 26)	Q35	991-013055
Transistor	Percussion Preamp (BC 114)	Q36	991-013044
POWER SUPPLY			
Assembly	Rectifier Board (PA-102)		996-013056
Assembly	Regulator Board (PA-103)		996-013057
Capacitor	Electrolytic 5 UF 35V		945-011203-34
Capacitor	Electrolytic 2000 UF 15V		945-011203-35
Capacitor	Electrolytic 2000 UF 45V		945-011203-13
Diode	Keying	D7	919-011215
Diode	Zener (ZF5, 6)	Z1	919-013058
Diode	Rectifier (Semikron B40 C2200/3500)	D3-6	919-013061
Fuse	4/10 Amp.		939-013065
Holder	Fuse		906-006303
Potentiometer	470 Ohm Voltage Adj	VR2	925-013059
Potentiometer	47K Stability Adj	VR3	925-013060
Resistor	150 Ohm 10W (Neoohm 737)		924-013062
Transistor	Voltage Sensor (1W9640)	Q14	991-011225
Transistor	Voltage Regulator (BC 113)	Q15	991-011219
Transistor	Voltage Regulator (RCA 2N5036)	Q16	991-013063
Transformer	Power (T-1045)	T1	954-013064
PREAMP & FILTER BOARD			
Assembly	Preamp & Filter Board (PA-98)		996-013047
Capacitor	Electrolytic 5 UF 12V		945-011203-27
Potentiometer	22K Flute Filter Adj	VR5, 6	925-011329
Transistor	Filter (BC 114)	Q22, 23, 27, 30	991-013044

FAST 4 & 5

SUSTAIN PREAMP BOARD (FAST 5 ONLY)

PART	DESCRIPTION	SCHEMATIC REFERENCE	PART NUMBER
Assembly	Sustain Preamp Board (PA-114-1)		996-013066
Capacitor	Electrolytic 5 UF 12V		945-011203-27
Coil	300 MH		952-013067
Transistor	Sustain Voicing Preamp (BC 114)	Q40-42	991-013044

TABSWITCH ASSEMBLY

PART	DESCRIPTION	SCHEMATIC REFERENCE	PART NUMBER
Actuator	Tabswitch (Black Plastic)		964-013068
Spring	Contact		975-011243
Tab	Pedal Bass Manual Soft-Sharp		915-011344-16
Tab	Manual Bass Selector Treble-Bass		915-011344-7
Tab	Slow Fast		915-011344-6
Tab	Light Heavy		915-011344-17
Tab	Vibrato Off-On		915-011344-5
Tab	Bass 16′		915-011344-9
Tab	Bass Clarinet 16′		915-011344-18
Tab	Flute 8′		915-011344-11
Tab	Oboe 8′		915-011344-12
Tab	Trumpet 8′		915-011344-13
Tab	Strings 8′		915-011344-14
Tab	Flute 4′		915-011344-15
Tab	Piccolo 4′		915-011344-19
Tab	Mixture		915-011344-20
Tab	Brilliance Mixture		915-011344-21
Tab	Long Short		915-011344-22
Tab	Manual Bass Off-On		915-011344-23
Tab	Treble Off-On		915-011344-24
Tab	Mixture Off-On		915-011344-25
Tab	Mixture Soft Sharp		915-011344-26
Tab	Celest 8′		915-011344-27
Tab	Clavicord 8′		915-011344-28
Tab	Kinura 8′		915-011344-29
Potentiometer	Bass Volume (22K)	VR4	925-011329

TONE GENERATOR ASSEMBLY

PART	DESCRIPTION	SCHEMATIC REFERENCE	PART NUMBER
Assembly	Oscillator Board (PA-73)		996-013069
Assembly	Divider Board (PA-74)		996-013070
Assembly	Sustain Board (PA-75) Fast 5 Only		996-013071
Capacitor	Electrolytic 50 UF 25V		945-011203-39
Coil	Tuning (C# - F#) T-4017		952-011207-1
Coil	Tuning (G - C) T-4018		952-011207-2
Diode	Vibrato & Sustain (1X9809)		919-013072
Transistor	Oscillator (1W9810/3)		991-011319
Transistor	Divider (1W9787)		991-011312

VIBRATO & SOLO DIVIDER BOARD

PART	DESCRIPTION	SCHEMATIC REFERENCE	PART NUMBER
Assembly	Vibrato & Solo Divider Board (PA-96) Fast 4 Only		996-013073
Assembly	Vibrato & Solo Divider Board (PA-96-1) Fast 5 Only		996-013074
Assembly	Divider Board (PA-74)		996-013070
Capacitor	50 UF 6V		945-011203-37
Capacitor	200 UF 6V		945-011203-38

FAST 4 & 5

PART	DESCRIPTION	SCHEMATIC REFERENCE	PART NUMBER
Potentiometer	Vibrato Speed Adj (22K)	VR1	925-011329
Transistor	Vib. Osc., 16′ & Pedal Solo Divider (1W9787)	Q12, 17-20	991-011318
Transistor	Vibrato Emitter Follower (BC 113)	Q13	991-011219
Transistor	Bass Preamp (BC 114)	Q21	991-013044
Transistor	Driver (1W9787) Fast 5 Only	Q42	991-011318

VOLTAGE FILTER BOARD (FAST 4 ONLY)

Assembly	D. C. Voltage Filter Board (PA-101)		996-013045
Capacitor	Electrolytic 1000 UF 25V		945-011203-18
Capacitor	Electrolytic 2000 UF 15V		945-011203-26

PROFESSIONAL

AMPLIFIER & PERCUSSION BOARD

Assembly	Amplifier & Percussion Board (PA-110)		996-013069
Diode	Keying (1818)	D9, 10	919-013059
Diode	Keying (1728)	D12, 13	919-013060
Diode	Keying (9803)	D7, 8, 11	919-013082
Capacitor	Electrolytic 10 UF 12V		945-011203-29
Capacitor	Electrolytic 25 UF 12V		945-011203-39
Capacitor	Electrolytic 25 UF 25V		945-011203-25
Capacitor	Electrolytic 50 UF 25V		945-011203-9
Capacitor	Electrolytic 100 UF 12V		945-011203-10
Capacitor	Electrolytic 500 UF 6V		945-011203-40
Capacitor	Electrolytic 1000 UF 12V		945-011203-21
Capacitor	Electrolytic 2000 UF 15V		945-011203-26
Potentiometer	500 Ohm Percussion Pulse Adj	VR14	925-013083
Potentiometer	10K Percussion Length Adj	VR15	925-011232
Potentiometer	470 Ohm Squelch Adj	VR16	925-013059
Transistor	16′ Solo Divider (1W1632)	Q14, 15	991-013056
Transistor	Percussion Multi, Preamp & Driver (1W9787)	Q31, 32, 36, 44	991-011318
Transistor	Percussion Driver & Output (1W9810)	Q33, 45	991-011319
Transistor	Percussion Modulator & Squelch Keyer (E103)	Q34, 41	991-013055
Transistor	Percussion Preamp & Output (BC114)	Q35, 46	991-013044
Transistor	Amplifier Input Preamp (BC109B)	Q42	991-013057
Transistor	Squelch Gate (1W9640)	Q43	991-013058

CONSOLE ASSEMBLY

Cord	Output (with plug)		989-013092
Cord	A. C. Power		989-011268
Cover	Organ Top		930-013089
Fuse	4/10 Amp (Slo-Blo)		939-013065
Handle	Cabinet		930-013024-4
Holder	Fuse		906-006303
Jack	Headphone		906-013038
Jack	Swell Pedal		906-013039
Light	Pilot		939-013062
Potentiometer	Level Adjustment	VR17	925-013063
Switch	Off/On Power		960-013064

PROFESSIONAL

KEYSWITCH ASSEMBLY

PART	DESCRIPTION	SCHEMATIC REFERENCE	PART NUMBER
Actuator	Keyswitch (White Plastic)		964-013065
Contact	Spring		975-013051
Key	C Natural Gray with metal channel		964-013065-C
Key	C# Natural Gray with metal channel		964-013065-C#
Key	D Natural Gray with metal channel		964-013065-D
Key	D# Natural Gray with metal channel		964-013065-D#
Key	E Natural Gray with metal channel		964-013065-E
Key	F Natural Gray with metal channel		964-013065-F
Key	F# Natural Gray with metal channel		964-013065-F#
Key	G Natural Gray with metal channel		964-013065-G
Key	G# Natural Gray with metal channel		964-013065-G#
Key	A Natural Gray with metal channel		964-013065-A
Key	A# Natural Gray with metal channel		964-013065-A#
Key	B Natural Gray with metal channel		964-013065-B
Key	All Sharps (White) with metal channel		964-013066
Spring	Pull Down		975-013050

POWER SUPPLY CHASSIS

PART	DESCRIPTION	SCHEMATIC REFERENCE	PART NUMBER
Assembly	Rectifier Board (PA-117)		996-013078
Capacitor	Regulator Board (PA-103)		996-013057
Capacitor	Electrolytic 5 UF 40V		945-011203-41
Capacitor	Electrolytic 1000 UF 12V		945-011203-21
Capacitor	Electrolytic 2000 UF 30V		945-011203-42
Capacitor	Electrolytic 2000 UF 12V		954-011203-26
Diode	Keying	D14	919-013081
Diode	Rectifier (Semikron B40C3200/2200)	D15-18	919-013079
Diode	Zener	Z1	919-013083
Fuse	4/10 Amp		939-013065
Holder	Fuse		906-006303
Potentiometer	470 Ohm Voltage Adj.	VR22, 24	925-013059
Potentiometer	47K Stability Adj.	VR23	925-013060
Resistor	150 Ohm 10W (Neoohm 737)		924-013062
Transistor	Voltage Sensor (1W9640)	Q47	991-011225
Transistor	Voltage Regulator (BC114)	Q48	991-011219
Transistor	Voltage Regulator (RCA 2N5036)	Q49	991-013063
Transformer	Power (T-1048)	T1	954-013081

TABSWITCH ASSEMBLY

PART	DESCRIPTION	SCHEMATIC REFERENCE	PART NUMBER
Actuator	Tabswitch (White Plastic)		964-013073
Contact	Spring		917-013074
Knob	Volume Slider (Dark Green)		925-013061-1
Knob	Volume Slider (Light Green)		925-013061-2
Knob	Volume Slider (Orange)		925-013061-3
Knob	Volume Slider (Yellow)	VR18-21	925-013061-4
Potentiometer	Slide-Volume Balance		925-013077
Tab	Blue		915-013075-1
Tab	Green		915-013075-2
Tab	Light Green		915-013075-3
Tab	Yellow		915-013075-4
Tab	Orange		915-013075-5
Tab	Percussion Duration (3 Position)		915-013076
Switch	Percussion Duration (3 Position)		960-013090
Switch	Percussion Squelch		960-013091

PROFESSIONAL

PART	DESCRIPTION	SCHEMATIC REFERENCE	PART NUMBER
TONE GENERATOR BOARD			
Assembly	Oscillator Board (PA-73)		997-013086
Assembly	Divider Board (PA-74)		997-013087
Assembly	Sustain Board (PA-75)		997-013088
Assembly	Tone Generator Board (PA-76) (3 Notes)		996-013070
Capacitor	1 UF 40V		945-011203-1
Capacitor	50 UF 25V		945-011203-9
Coil	Tuning (F#-B) T-4023	L1	952-013085-1
Coil	Tuning (C-F) T-4024	L1	952-013085-2
Diode	Keying (1809)	D1	919-013067
Transistor	Master Oscillator (1W9810)	Q1	991-011319
Transistor	Divider (1W9787)	Q2-13	991-011318
VIBRATO, FILTER & PREAMP BOARD			
Assembly	Vibrato, Filter & Preamp Board (PA-112)		996-013035
Capacitor	Electrolytic 50 UF 6V		945-011203-37
Capacitor	Electrolytic 50 UF 25V		945-011203-9
Capacitor	Electrolytic 200 UF 6V		945-011203-38
Capacitor	Electrolytic 500 UF 6V		945-011203-40
Coil	220 MH (18/11-3H1)	L2, 3	952-013022
Potentiometer	20K Vibrato Level	VR12	925-013084
Potentiometer	50K Vibrato Depth	VR13	925-011233
Transistor	Clarinet/Sharp Preamp & Vibrato Osc. (1W9787)	Q16, 17, 37	991-011318
Transistor	Vibrato Phase Shifter & Output Preamp (BC114)	Q38, 40	991-013044
Transistor	Vibrato Phase Keyer (E103)	Q39	991-013055
VOICING BOARD			
Assembly	Voicing Board (PA-111)		996-013071
Capacitor	1 UF 12V		945-011203-1
Capacitor	5 UF 12V		945-011203-27
Capacitor	1000 UF 12V		945-011203-21
Potentiometer	22K Filter Adj	VR1-11	925-011329
Transistor	Flute & Celeste Filters & Flute Preamp (BC114)	Q18-29	991-013044
Transistor	Celeste/Kinura Preamp	Q30	991-013068